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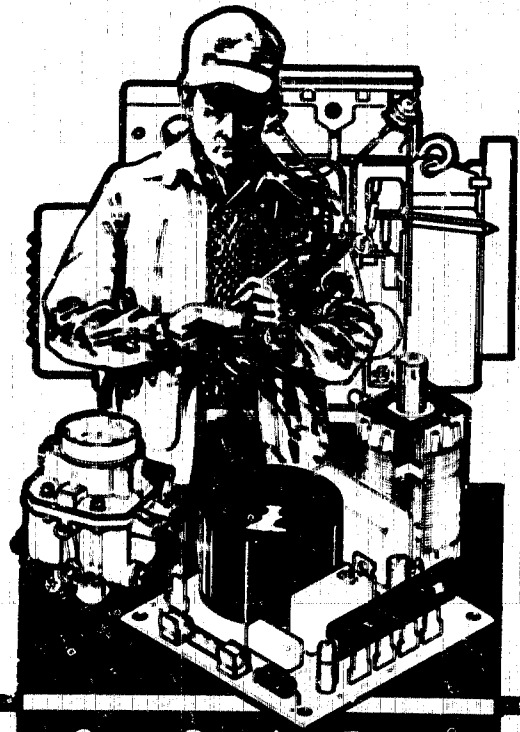
McGRAW-EDISON

Onan

Parts Manual

MDEH

Marine GenSet



Onan Service Parts

976-0222
3-84 (Spec K)
Replaces
3-83 (Spec K)
Printed in U.S.A.

GENERAL INFORMATION

INSTRUCTIONS FOR ORDERING REPAIR PARTS

For parts or service, contact the dealer from whom you purchased this equipment or refer to your Nearest Authorized Onan Parts and Service Center.

To avoid errors or delay in filling your parts order, please furnish all information requested.

Always refer to the nameplate on your unit.

1. Always give the MODEL, SPEC NO. and SERIAL NO.

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MODEL AND SPEC NO.

SERIAL NO.

For handy reference, insert "YOUR" nameplate information in the spaces above.

2. Do not order by reference number; always use part number and description.
3. Give the part number, description and quantity needed of each item. If an older part cannot be identified, return the part prepaid to your dealer or nearest Onan Parts and Service Center. Print your name and address plainly on the package. Write a letter to the same address stating the reason for returning the part.
4. State definite shipping instructions. Any claim for loss or damage to your unit in transit should be filed promptly against the transportation company making the delivery. Shipments are complete unless the packing list indicates items are back ordered.

Prices are purposely omitted from this Parts Manual due to the confusion resulting from fluctuating costs, import duties, sales taxes, exchange rates, etc.

For current parts prices, consult your Onan Dealer, Distributor or Parts and Service Center.

"En esta lista de partes los precios se omiten de proposito, ya que bastante confusion resulto de fluctuaciones de los precios, derechos aduanales, impuestos de venta, cambios extrajeros, etc."

Consiga los precios vigentes de su distribuidor de productos "ONAN."

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INTRODUCTION

FORWARD

This parts manual applies to the standard generator sets listed below. Any engine parts modified or added to the set will be listed in this manual. These modified or added parts supersede similar parts listed in the Onan Engine manual. The illustrations are arranged in groups of related items, and each part or assembly is identified by a reference number. All parts illustrated are typical, and unless otherwise mentioned, parts are interchangeable. These typical illustrations are subject to change and reflect only the latest replacement parts arrangement. The Right and Left generator set sides are determined by facing the front end of the engine.

SET DATA TABLE

| MODEL IDENTIFICATION | RATING | MODEL IDENTIFICATION | RATING |
|----------------------|--------------|----------------------|--------------|
| 25.0 MDEH - * #£ | 25,000 Watts | 30.0 MDEH - * #£ | 30,000 Watts |

ELECTRICAL DATA TABLE

| *VOLTAGE CODES | VOLTS | HERTZ | WIRE | PHASE | NOTES |
|----------------|---------|-------|------|-------|-------|
| 3 | 120 240 | 60 | 3 | 1 | |
| 6C | 240 480 | 60 | 4 | 3 | |
| 7 | 220 380 | 60 | 4 | 3 | |
| 9X | 347 600 | 60 | 4 | 3 | |
| 15 | 120 240 | 60 | 12 | 1 | . |
| 15 | 120 208 | 60 | 12 | 3 | . |
| | 120 240 | | | | |
| | 127 220 | | | | |
| | 139 240 | | | | |
| | 240 416 | | | | |
| | 254 440 | | | | |
| | 227 480 | | | | |
| 53 | 120 240 | 50 | 3 | 1 | . |
| 515 | 110 220 | 50 | 12 | 1 | . |
| | 115 230 | | | | |
| 515 | 110 190 | 50 | 12 | 3 | . |
| | 110 220 | | | | |
| | 115 200 | | | | |
| | 115 230 | | | | |
| | 120 208 | | | | |
| | 127 220 | | | | |
| | 220 380 | | | | |
| | 230 400 | | | | |
| | 240 416 | | | | |
| | 254 440 | | | | |

- * - Voltage codes follow model letters designations
- # - Specification number, number 1 is standard, all others indicate variations
- £ - Specification letter, letter advances (A to B, B to C, etc.) with major manufacturing changes
- These generators are reconnectable, refer to Operator's manual for wiring data

Engine Section

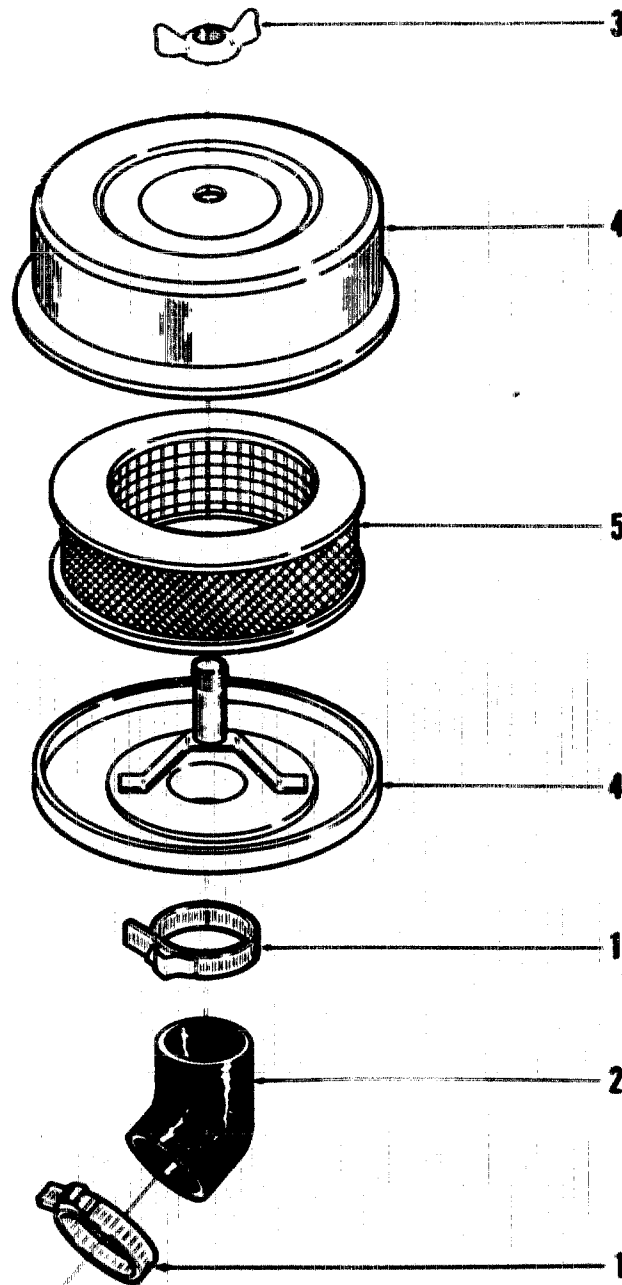
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ENGINE REPLACEMENT PARTS

All engine replacement parts must be ordered from the engine manufacturer, except those modified or added by Onan. When ordering engine parts, refer to the manufacturer's nameplate and supply the Model, Spec. Serial numbers and other available information. Refer to the engine manufacturer's manuals for your nearest authorized distributor or parts center; or contact the Onan distributor from whom you purchased this set or assistance in ordering replacement parts.

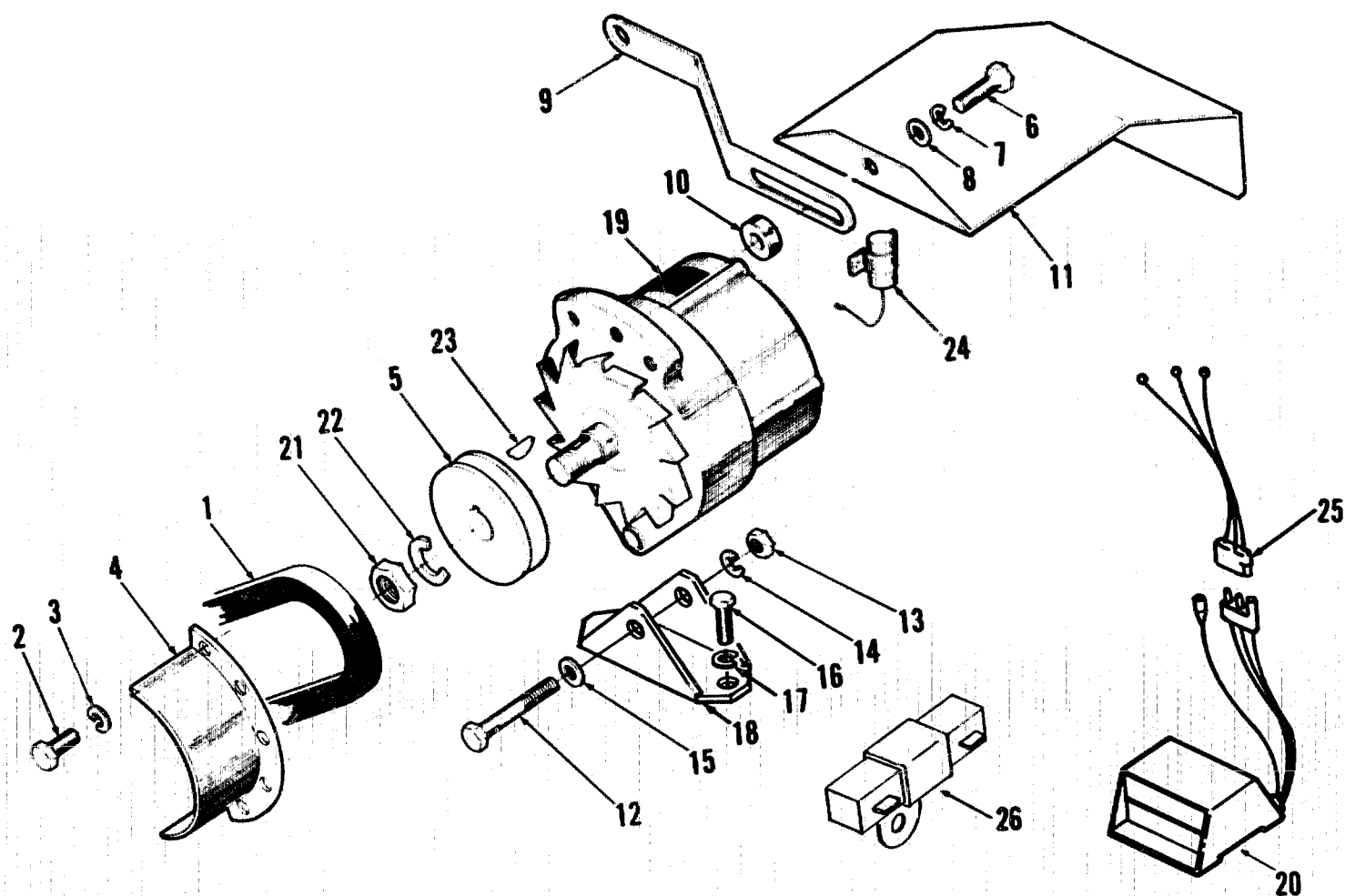
AIR CLEANER



FS-1515

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|---|
| 1 | 503-0354 | 2 | Clamp, Hose |
| 2 | 503-1187 | 1 | Hose, Rubber - Preformed |
| 3 | 865-0020 | 1 | Nut, Wing (1/4-20) |
| 4 | 140-1091 | 1 | Air Cleaner Assembly (Includes Element) |
| 5 | 140-1089 | 1 | Element, Air Cleaner |

ALTERNATOR



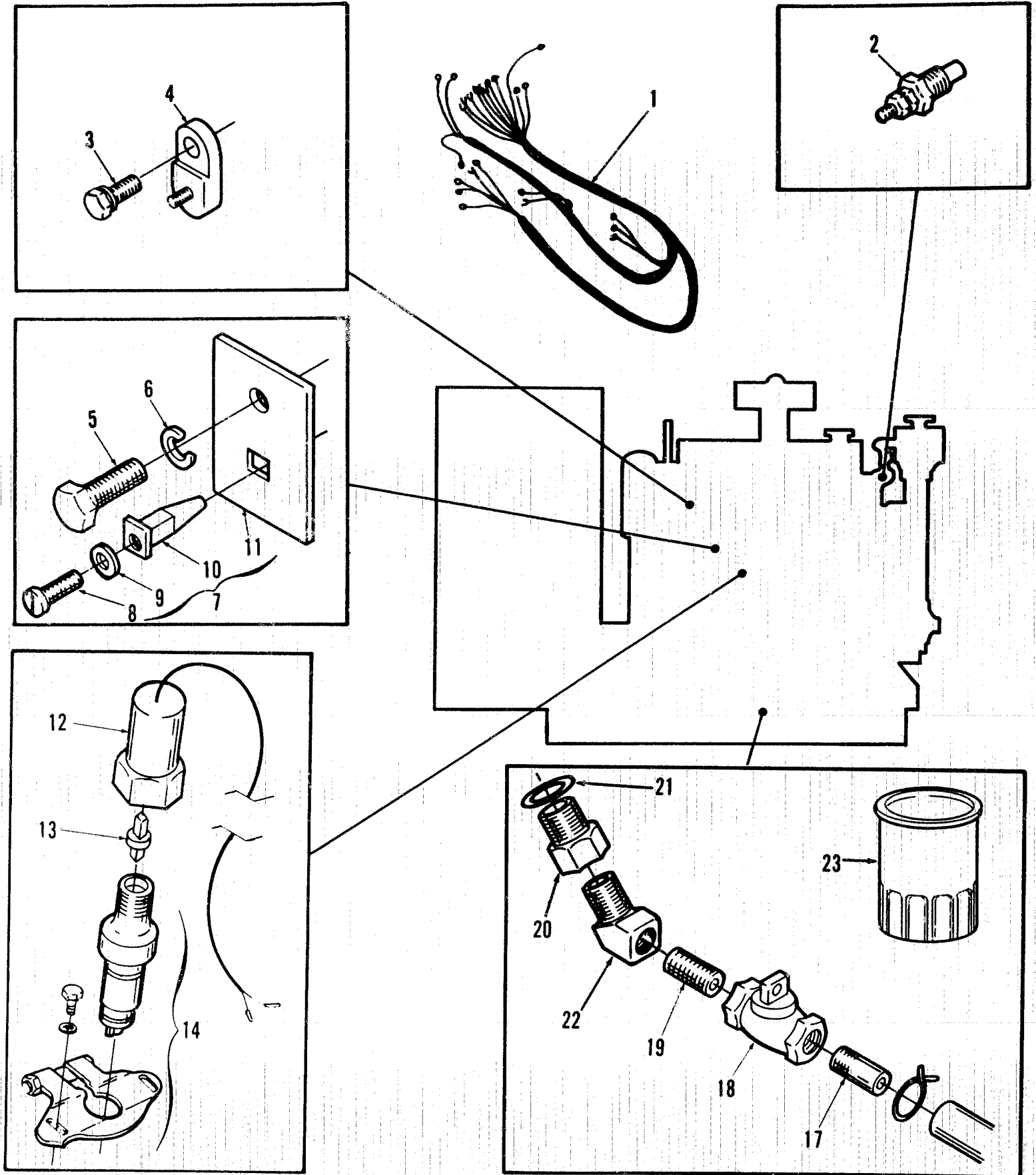
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| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|--|
| 1 | 511-0084 | 1 | Belt, Drive |
| 2 | 800-0024 | 1 | Screw, Cap - Hex Head (5/16-18 x 1/2") |
| 3 | 850-0045 | 1 | Washer, Lock - Spring (5/16") |
| 4 | 191-0725 | 1 | Guard, Belt |
| 5 | 191-0781 | 1 | Pulley |
| 6 | 800-0030 | 1 | Screw, Cap - Hex Head (5/16-18 x 1-1/4") |
| 7 | 850-0045 | 1 | Washer, Lock - Spring (5/16") |
| 8 | 526-0030 | 1 | Washer, Flat (13/32"ID x 7/8"OD x 1/8"Thk) |
| 9 | 191-0101 | 1 | Strap, Adjusting |
| 10 | 191-0791 | 1 | Spacer (Optional) |
| 11 | 191-0619 | 1 | Heat Shield (Optional) |
| 12 | 800-1096 | 1 | Screw, Cap - Hex Head (1/2-13 x 2-1/2") |
| 13 | 862-0016 | 1 | Nut, Hex (1/2-13) |
| 14 | 850-0060 | 1 | Washer, Lock - Spring (1/2") |
| 15 | 526-0219 | 3 | Washer, Flat (17/32"ID x 1"OD x 1/8"Thk) |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--------------------------------------|-----------|---|
| 16 | 850-0051 | 2 | Screw, Cap - Hex Head (3/8-16 x 1-1/4") |
| 17 | 850-0050 | 2 | Washer, Lock - Spring (3/8") |
| 18 | 191-1554 | 1 | Bracket, Mounting |
| 19 | ALTERNATOR (Includes Parts Marked £) | | |
| | 191-1257 | 1 | 12 VDC |
| | 191-1258 | 1 | 24/32 VDC |
| 20 | REGULATOR, VOLTAGE | | |
| | 191-1389 | 1 | 12 VDC |
| | 191-0548 | 1 | 24 VDC |
| | 191-1259 | 1 | 32 VDC |
| 21 | 868-0007 | 1 | £Nut, Hex (5/8-18) |
| 22 | 850-0070 | 1 | £Washer, Lock-Spring (5/8") |
| 23 | 515-0093 | 1 | £Key, Woodruff (#5) |
| 24 | 312-0201 | 1 | Capacitor (Not used all applications) |
| 25 | 191-0681 | 1 | Cable, Electrical (Alternator to Regulator) |
| 26 | 191-0550 | 1 | Resistor (Used with 191-1258 Alternator) |

£ - Parts included with Alternators

MISCELLANEOUS ENGINE PARTS - LEFT SIDE



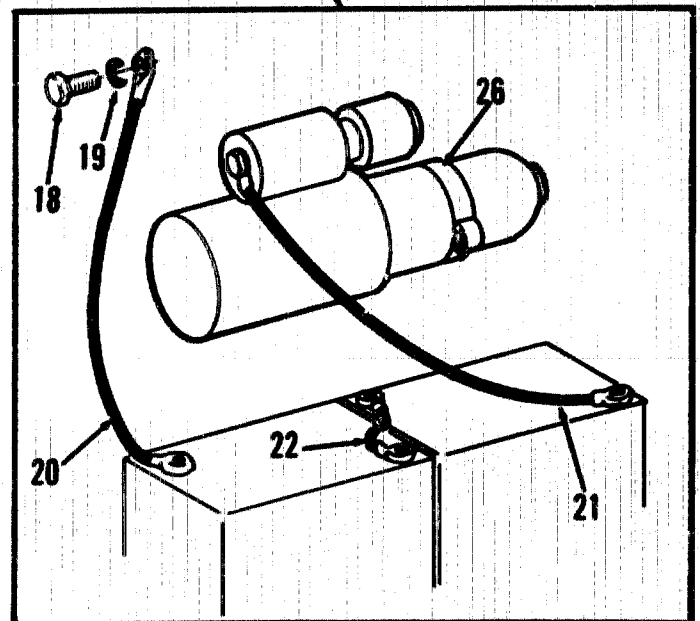
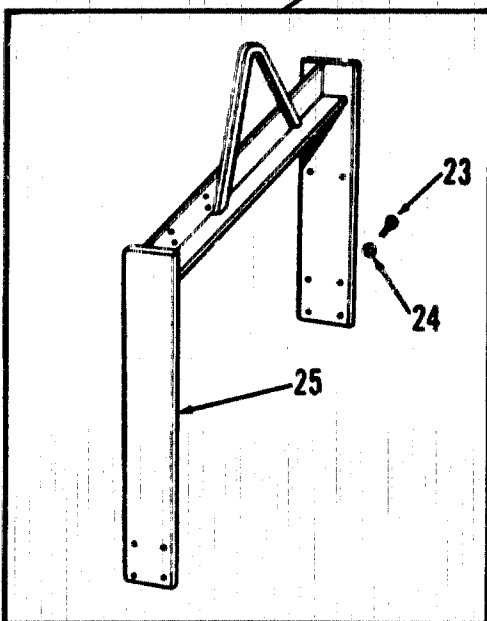
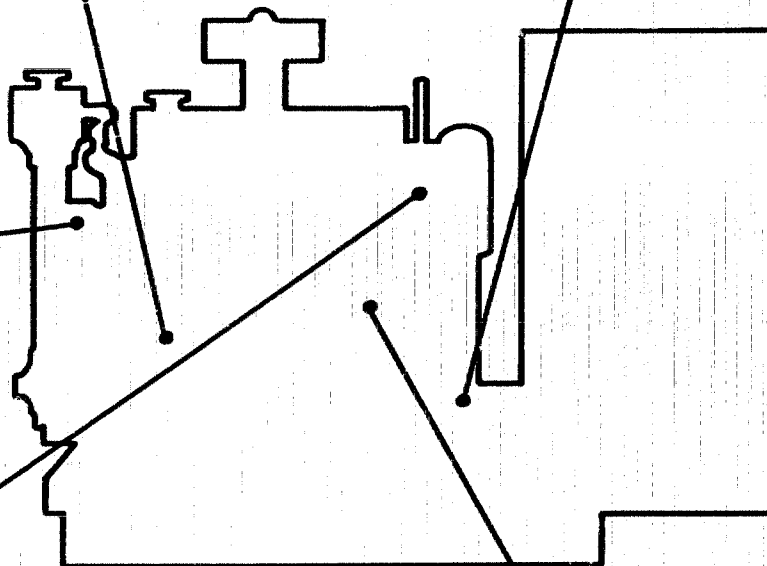
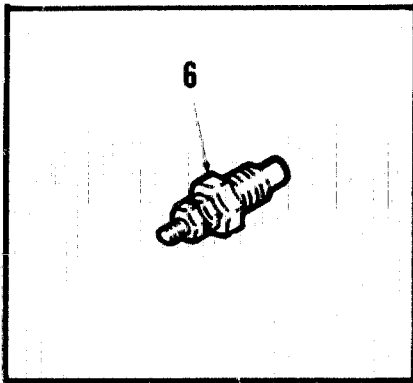
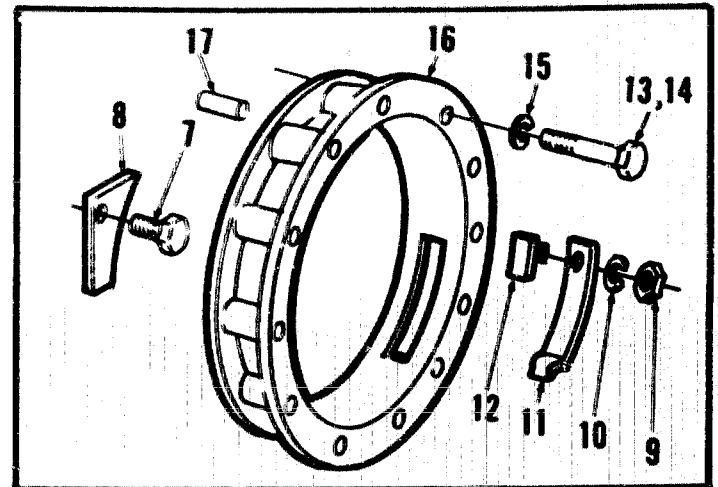
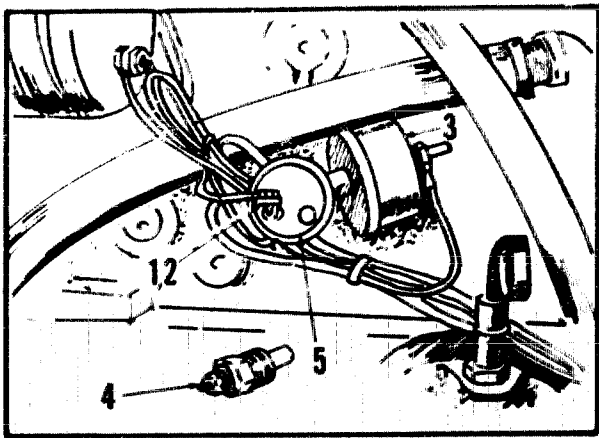
MISCELLANEOUS ENGINE PARTS - LEFT SIDE

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|-------------|-------------------------------------|--------------|-----------------------------------|-------------|-------------|--------------|----------------------------------|
| 1 | WIRING HARNESS - ENGINE 338-1693 | 1 | Standard | 9 | 508-0015 | 1 | +Washer, Insulating - Fiber (#8) |
| | | 1 | Special (NOTE: Use Standard | 10 | 870-0196 | 1 | +Nut, Insulating (#8) |
| | | | Wiring Harness and add | 11 | 332-1281 | 1 | +Plate, Mounting - Terminal |
| | | | electrical leads as required | 12 | 302-0750 | 1 | *Sender, Tachometer |
| | | | for optional sensors, switches | 13 | 302-0751 | 1 | Tang, Drive - Tachometer |
| | | | per Gen Set wiring diagram) | | | | Sender |
| 2 | 193-0246 | 1 | *Sender, Temperature - | 14 | 302-0757 | 1 | Drive Assembly - Tachometer |
| | | | Engine Coolant | 15 | 503-0131 | 1 | Clamp, Hose |
| 3 | 821-0029 | 1 | Screw, Self-locking - | 16 | 503-0891 | 1 | Hose, Rubber (5/8"ID x |
| | | | Hex Washer Head | | | | 7/8"OD x 14"Lg) |
| | | | (3/8-16 x 3/4") | 17 | 505-0135 | 1 | Nipple, Pipe - Half |
| 4 | 309-0269 | 1 | *Switch, Thermostatic - | | | | (3/8"NPT x 1-1/2"Lg) |
| | | | Low Engine Temperature | 18 | 504-0030 | 1 | Valve, Cock - Brass (3/8"NPT) |
| 5 | 800-0047 | 1 | Screw, Cap - Hex Head | 19 | 505-0101 | 1 | Nipple, Pipe - Close |
| | | | (3/8-16 x 5/8") | | | | (3/8"NPT x 1") |
| 6 | 856-0010 | 1 | Washer, Lock - External/Internal | 20 | 102-0619 | 1 | Adapter, Oil Drain |
| | | | Tooth (3/8") | 21 | 102-0532 | 1 | Gasket, "O" Ring |
| 7 | 332-1292 | 1 | Terminal Board (Includes | 22 | 505-0119 | 1 | Elbow, Pipe - Street - 45 Deg |
| | | | Parts Marked -) | | | | (3/8 NPT) |
| 8 | 809-0035 | 1 | +Screw, Machine - Thread Cutting, | 23 | 122-0644 | 1 | Filter, Oil |
| | | | Round Head (#8 x 3/4") | | | | |

* - Items used with fault lights or gauges on Engine Control Panel.

+ - Parts Included in Terminal Board.

MISCELLANEOUS ENGINE PARTS - RIGHT SIDE



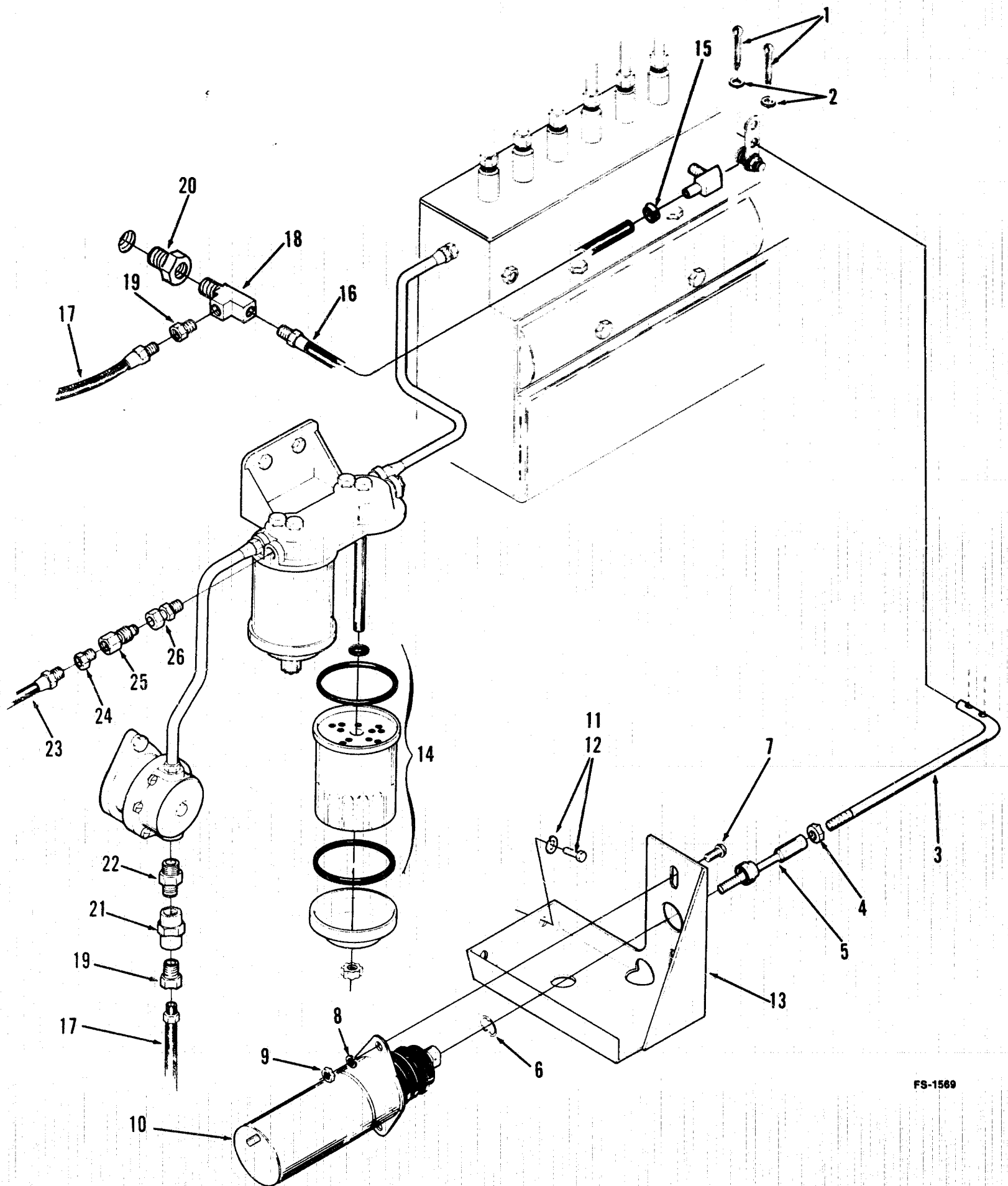
MISCELLANEOUS ENGINE PARTS - RIGHT SIDE

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--|-----------|--|
| 1 | 309-0064 | 1 | *Switch, Pressure - Oil (Shutdown) |
| 2 | 309-0169 | 1 | *Switch, Pressure - Oil (Pre-Alarm) |
| 3 | 193-0244 | 1 | *Sender, Pressure - Oil |
| 4 | 193-0249 | 1 | Sender, Temperature - Oil |
| 5 | MOUNTING HARDWARE (Select as Applicable) | | |
| | 505-0059 | 1 | Tee, Pipe (1/8"NPT) |
| | 505-0763 | 1 | Cross, Pipe (1/8"NPT) |
| | 505-0098 | 1 | Nipple, Pipe - Close (1/8"NPT x 3/4") |
| | 505-0007 | 1 | Bushing, Reducer - Hex (1/4"NPT x 1/8"NPT) |
| 6 | *SWITCH, HIGH ENGINE TEMPERATURE | | |
| | 309-0178 | 1 | Shutdown |
| | 309-0179 | 1 | Pre-Alarm |
| 7 | 800-0069 | 1 | Screw, Cap - Hex Head (7/16-14 x 3/4") |
| 8 | 191-0802 | 1 | Cover, Access - Starter |
| 9 | 862-0001 | 2 | Nut, Hex (1/4-20) |
| 10 | 850-0040 | 2 | Washer, Lock - Spring (1/4") |
| 11 | 232-2210 | 2 | Cover, Access - Generator Adapter |
| 12 | 232-2211 | 2 | Catch, Access Cover |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|--|
| 13 | 800-007L | 8 | Screw, Cap - Hex Head (7/16-14 x 1-1/4") |
| 14 | 800-0076 | 1 | Screw, Cap - Hex Head (7/16-14 x 2-1/4") |
| 15 | 850-0055 | 9 | Washer, Lock - Spring (7/16") |
| 16 | 231-0149 | 1 | Adapter, Generator |
| 17 | 516-0152 | 2 | Pin, Dowel - Adapter Alignment |
| 18 | 800-0071 | 1 | Screw, Cap - Hex Head (7/16-14 x 1") |
| 19 | 856-0012 | 1 | Washer, Lock - External/Internal Tooth (7/16") |
| 20 | 416-0530 | 1 | Cable, Battery - Negative (16"Lg) |
| 21 | 416-0531 | 1 | Cable, Battery - Positive (24"Lg) |
| 22 | 416-0446 | 1 | Cable, Battery - Jumper |
| 23 | 800-0072 | 8 | Screw, Cap - Hex Head (7/16-14 x 1-1/4") |
| 24 | 850-0055 | 8 | Washer, Lock - Spring (7/16") |
| 25 | 403-0836 | 1 | Bracket, Lifting |
| 26 | STARTER | | |
| | 191-0722 | 1 | 12 VDC |
| | 191-0703 | 1 | 24/32 VDC |

* - Items used with fault lights or gauges on Engine Control Panel.

FUEL SYSTEM



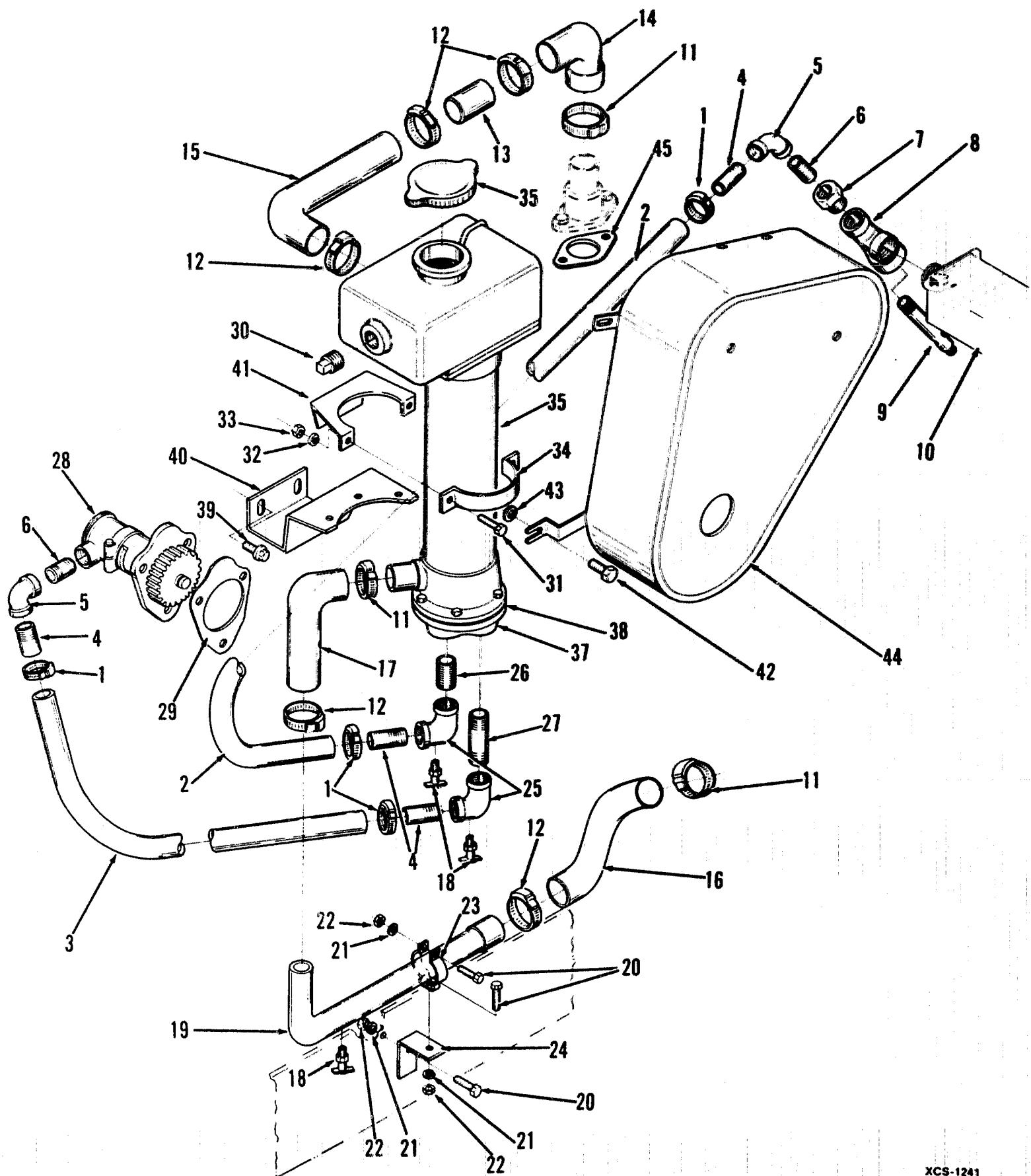
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FUEL SYSTEM

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|-----------------------------|-----------|---|
| 1 | 516-0027 | 2 | Pin, Cotter (1/16" x 1/2" Lg) |
| 2 | 526-0016 | 2 | Washer, Flat (17/64" ID x 9/16" OD x 1/32" Thk) |
| 3 | ROD, ACTUATING - FUEL VALVE | | |
| | 150-1943 | 1 | MDEH (4-3/4" Lg) |
| | 150-1944 | 1 | MDEG (9" Lg) |
| 4 | 862-0001 | 1 | Nut, Hex (1/4-20) |
| 5 | 150-1945 | 1 | Ball Joint |
| 6 | 850-0040 | 1 | Washer, Lock - Spring (1/4") |
| 7 | 812-0150 | 2 | Screw, Machine - Round Head (1/4-20 x 5/8") |
| 8 | 850-0040 | 2 | Washer, Lock - Spring (1/4") |
| 9 | 862-0001 | 2 | Nut, Hex (1/4-20) |
| 10 | 307-1904 | 1 | Solenoid - 12 VDC |
| 11 | 800-0071 | 2 | Screw, Cap - Hex Head (7/16-14 x 1") |
| 12 | 850-0055 | 2 | Washer, Lock - Spring (7/16") |
| 13 | 306-0214 | 1 | Bracket, Mounting - Solenoid |
| 14 | 149-1697 | 2 | Element - Fuel Filter (Includes Gaskets) |
| 15 | 503-0685 | 1 | Clamp Hose |
| 16 | LINE, FUEL - FLEXIBLE | | |
| | 501-0481 | 1 | MDEH (20" Lg x 1/8-27 NPT Male) |
| | 501-0480 | 1 | MDEG (30" Lg x 1/8-27 NPT Male) |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|---|
| 17 | 501-0242 | 2 | Line, Fuel - Flexible (24" Lg, 5/8-18 Female Swivel both ends) |
| 18 | 502-0058 | 1 | Tee, Pipe - Street (1/8-27 NPT) |
| 19 | 502-0577 | 2 | Adapter, Pipe - Hex (5/8-18 x 1/8-27 NPT) |
| 20 | 502-0306 | 1 | Adapter, Pipe - Hex (5/16-24 x 1/8-27 NPT) |
| 21 | 502-0051 | 1 | Coupling, Pipe (1/8-27 NPT) |
| 22 | 502-0193 | 1 | Connector, Pipe - Male (1/8-27 NPT x 1/2-20 SAE) |
| 23 | 501-0227 | 1 | Line, Fuel - Flexible (24" Lg, 1/8-27 Male x 1/8-27 Male Swivel) |
| 24 | 505-0007 | 1 | Bushing, Reducer - Hex (1/4-18 NPT x 1/8-27 NPT) |
| 25 | 502-0678 | 1 | Adapter, Pipe - Hex (1/4-18 NPT Female x 9/16-18 UNF Male SAE 37 Deg) |
| 26 | 502-0872 | 1 | Adapter, Pipe - Hex (9/16-18 Female SAE 37 Deg x M14 x 1.5 MM) |

COOLING SYSTEM WITH HEAT EXCHANGER

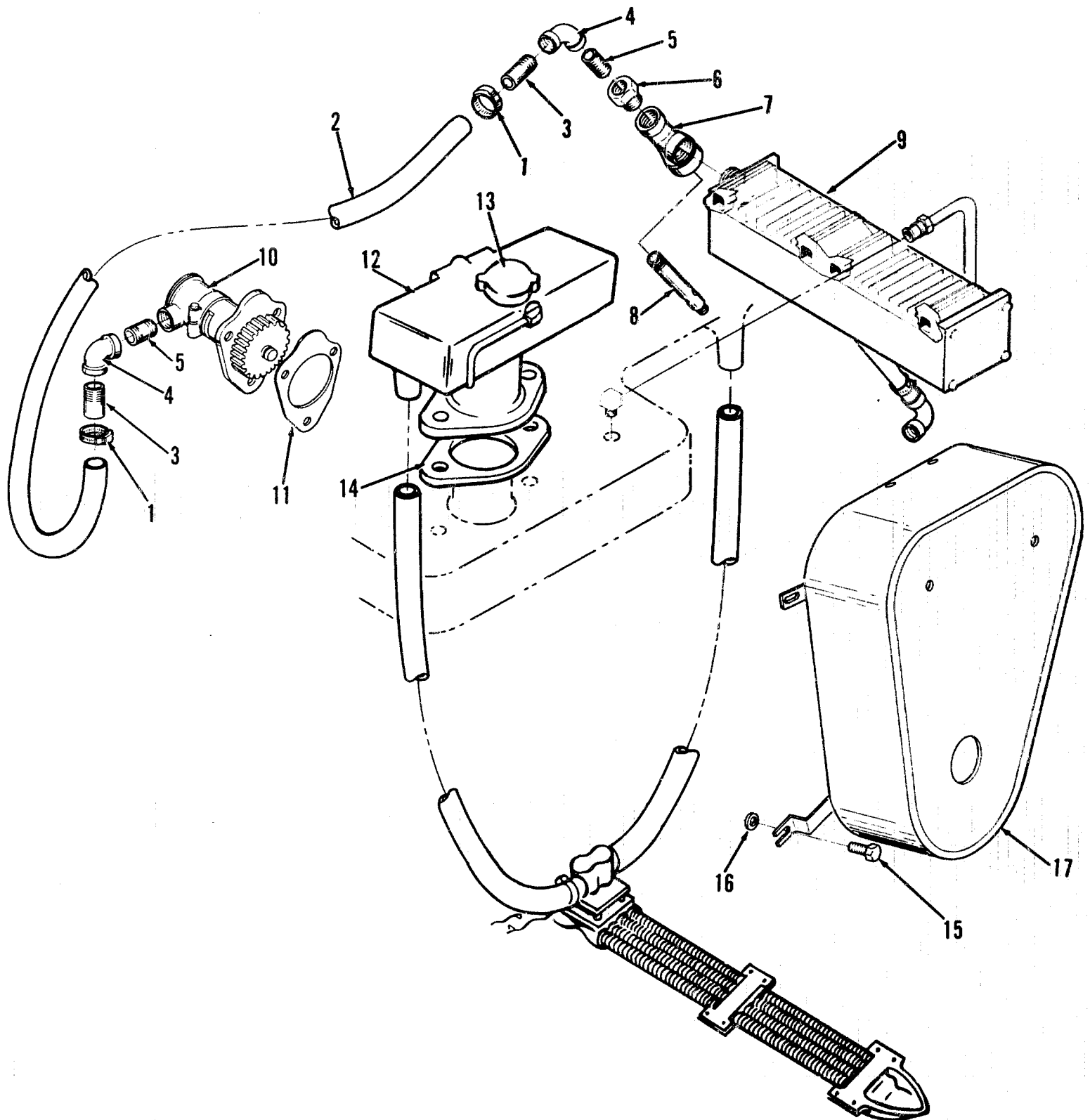


XCS-1241

COOLING SYSTEM WITH HEAT EXCHANGER

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|-------------|-------------|--------------|---|
| 1 | 503-0189 | 4 | Clamp, Hose |
| 2 | 503-1164 | 1 | Hose, Rubber (1"ID x 1-3/8"OD x 48"Lg) |
| 3 | 503-1163 | 1 | Hose, Rubber (1"ID x 1-3/8"OD x 24"Lg) |
| 4 | 505-0907 | 4 | Nipple, Pipe - Half, Brass (3/4"NPT x 2"Lg) |
| 5 | 505-0909 | 2 | Elbow, Pipe - 90 Deg, Brass (3/4"NPT) |
| 6 | 505-0912 | 2 | Nipple, Pipe - Close, Brass (3/4"NPT) |
| 7 | 505-0772 | 1 | Bushing, Reducer - Hex (1-1/4"NPT x 3/4"NPT) |
| 8 | 505-0771 | 1 | Tee, Pipe - Reducing (2"NPT x 2"NPT x 1-1/4"NPT) |
| 9 | 130-0725 | 1 | Tube, Injection - Water |
| 10 | | REF | Manifold, Exhaust - Liquid Cooled (See Separate Figure for Components) |
| 11 | 503-0365 | 3 | Clamp, Hose |
| 12 | 503-0004 | 5 | Clamp, Hose |
| 13 | 130-0508 | 1 | Adapter, Tube |
| 14 | 503-1218 | 1 | Hose, Rubber - Preformed |
| 15 | 503-0553 | 1 | Hose, Rubber - Preformed |
| 16 | 503-1216 | 1 | Hose, Rubber - Preformed |
| 17 | 503-1220 | 1 | Hose, Rubber - Preformed |
| 18 | 504-0005 | 3 | Cock, Drain (1/8"NPT) |
| 19 | 130-2230 | 1 | Tube, Preformed |
| 20 | 800-0007 | 3 | Screw, Cap - Hex Head (1/4-20 x 1") |
| 21 | 850-0040 | 3 | Washer, Lock - Spring (1/4") |
| 22 | 862-0001 | 3 | Nut, Hex (1/4-20) |
| 23 | 331-0101 | 1 | Hanger, Pipe |
| 24 | 130-2231 | 1 | Bracket, Angle |
| 25 | 505-0938 | 2 | Elbow, Pipe - 90 Deg, Reducing, with Tapped Drain Port (1"NPT x 3/4"NPT) |
| 26 | 505-0908 | 1 | Nipple, Pipe - Close, Brass (1"NPT x 1-1/2"Lg) |
| 27 | 509-0910 | 1 | Nipple, Pipe - Brass (1"NPT x 3"Lg) |
| 28 | 132-0274 | 1 | Pump, Water - Replacement (Does Not Include Mounting Adapter and Gear) |
| 29 | 132-0273 | 1 | Gasket |
| 30 | 505-0130 | 1 | Plug, Pipe - Square Head (3/4"NPT) |
| 31 | 800-0007 | 2 | Screw, Cap - Hex Head (1/4-20 x 1") |
| 32 | 850-0040 | 2 | Washer, Lock - Spring (1/4") |
| 33 | 862-0001 | 2 | Nut, Hex (1/4-20) |
| 34 | 130-0722 | 1 | Clamp |
| 35 | 130-0505 | 1 | Heat Exchanger (Includes End Bonnet, Gasket, Pressure Cap) |
| 36 | 130-0900 | 1 | Cap, Radiator (4 Lb) |
| 37 | 130-0901 | 1 | Bonnet, End |
| 38 | 130-0902 | 1 | Gasket |
| 39 | 821-0016 | 4 | Screw, Self-locking - Hex Washer Head (5/16-18 x 3/4") |
| 40 | 130-0715 | 1 | Bracket, Support - Lower |
| 41 | 130-2227 | 1 | Bracket, Support - Upper |
| 42 | 800-0048 | 3 | Screw, Cap - Hex Head (3/8-16 x 3/4") |
| 43 | 526-0029 | 2 | Washer, Flat (3/8") |
| 44 | 130-2223 | 1 | Guard, Belt |
| 45 | 130-1016 | 1 | Gasket - Water Outlet |

COOLING SYSTEM WITH KEEL COOLER

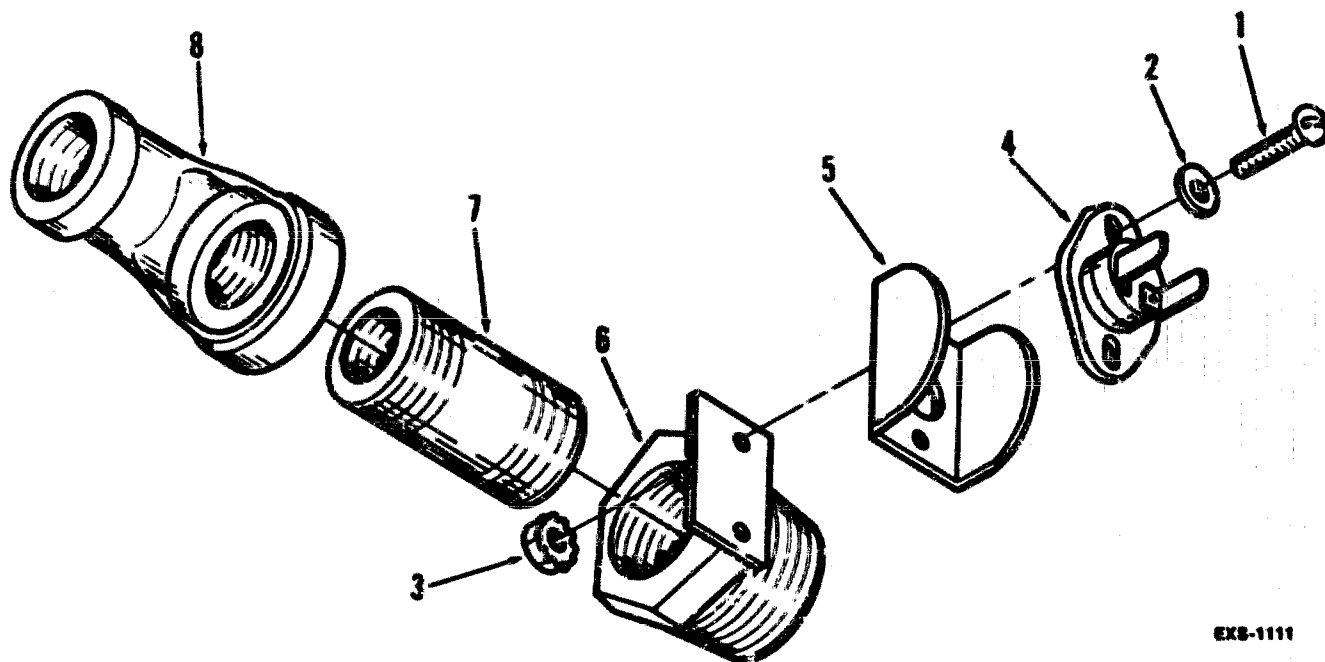


KEEL COOLING SYSTEM

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|-------------|-------------|--------------|---|
| 1 | 503-0189 | 2 | Clamp, Hose |
| 2 | 503-1164 | 1 | Hose, Rubber (1"ID x 1-3/8"OD x 48"Lg) |
| 3 | 505-0907 | 2 | Nipple, Pipe - Half, Brass (3/4"NPT x 2"Lg) |
| 4 | 505-0909 | 2 | Elbow, Pipe - 90 Deg, Brass (3/4"NPT) |
| 5 | 505-0912 | 2 | Nipple, Pipe - Close, Brass (3/4"NPT) |
| 6 | 505-0772 | 1 | Bushing, Reducer - Hex (1-1/4"NPT x 3/4"NPT) |
| 7 | 505-0771 | 1 | Tee, Pipe - Reducing (2"NPT x 2"NPT x 1-1/4"NPT) |
| 8 | 130-0725 | 1 | Tube, Injection - Water |
| 9 | | REF | Manifold, Exhaust - Liquid Cooled (See Separate Figure for Components) |
| 10 | 132-0274 | 1 | Pump, Water - Replacement (Does Not Include Adapter and Gear) |
| 11 | 132-0273 | 1 | Gasket |
| 12 | 130-0705 | 1 | Tank, Expansion (Includes Cap) |
| 13 | 130-0900 | 1 | Cap, Radiator (4 Lb) |
| 14 | 130-1016 | 1 | Gasket |
| 15 | 800-0048 | 3 | Screw, Cap - Hex Head (3/8-16 x 3/4") |
| 16 | 526-0029 | 2 | Washer, Flat (3/8") |
| 17 | 130-2223 | 1 | Guard, Belt |

NOTE: See your authorized Onan Marine Dealer for parts or service on items installed between the Generator Set and the Keel Cooler

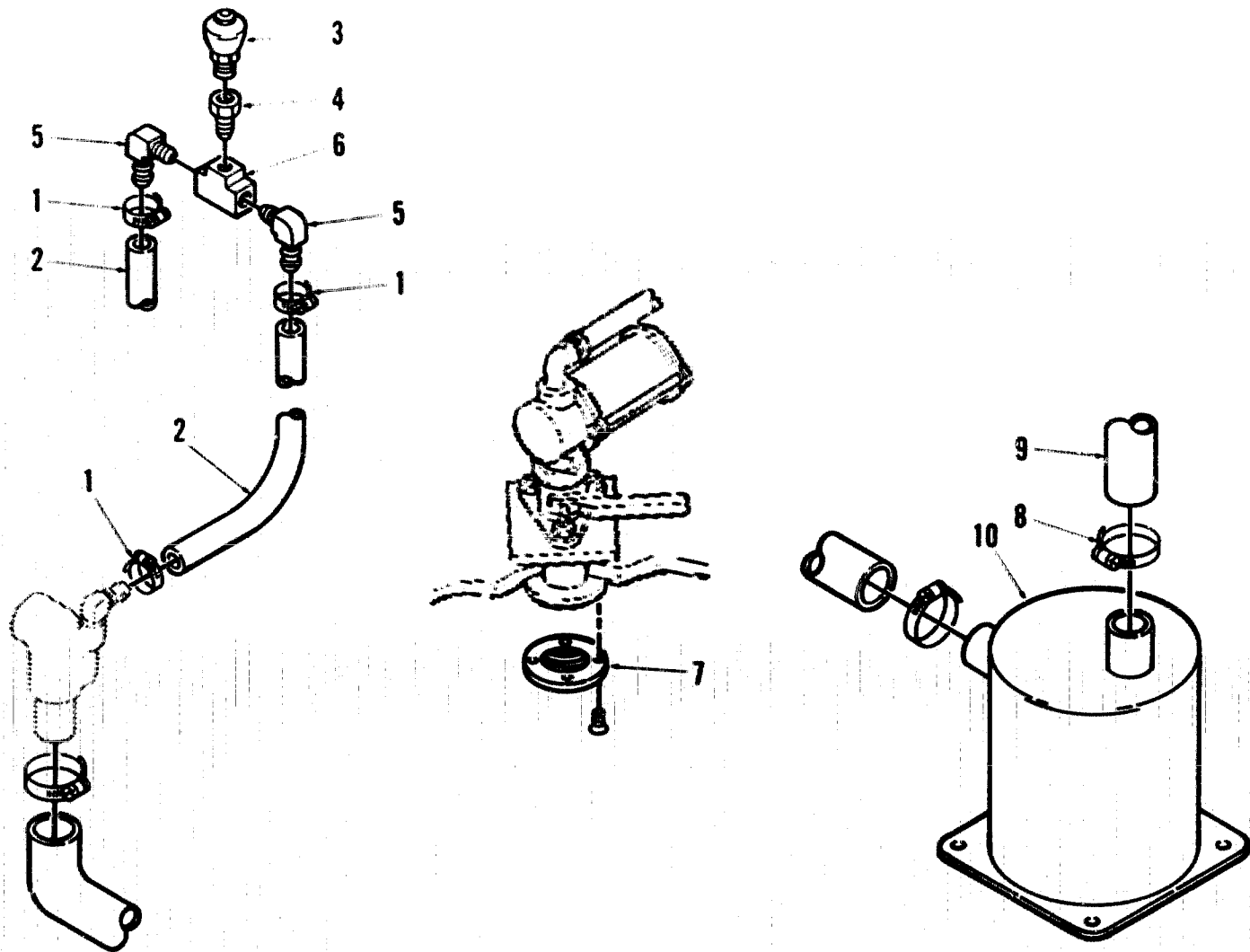
HIGH EXHAUST TEMPERATURE SWITCH



EXB-1111

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|-------------|------------------------------------|--------------|---|
| 1 | 812-0061 | 2 | Screw, Machine - Round Head (#6-32 x 3.8") |
| 2 | 526-0018 | 2 | Washer, Flat (17/64" ID x 5/8" OD x 1/16" Thk) |
| 3 | 870-1183 | 2 | Nut, With ET Lockwasher (#6-32) |
| 4 | 309-0484 | 1 | Switch, High Temperature |
| 5 | 309-0501 | 1 | Shield, Switch |
| 6 | BUSHING WITH SWITCH MOUNTING PLATE | | |
| | 505-1336 | 1 | MDEG (3" NPT x 2-1/2" NPT) |
| | 505-1337 | 1 | MDEH (2-1/2" NPT x 2" NPT) |
| 7 | NIPPLE, PIPE | | |
| | 505-0114 | 1 | MDEG (2-1/2" NPT x 3") |
| | 505-0645 | 1 | MDEH (2" NPT x 3") |
| 8 | TEE, PIPE - REDUCING | | |
| | 505-1334 | 1 | MDEG (2-1/2" NPT x 1-1/4" NPT x 2-1/2" NPT) |
| | 505-0771 | 1 | MDEH (2" NPT x 1-1/4" NPT x 2" NPT) |

MARINE EXHAUST SYSTEM

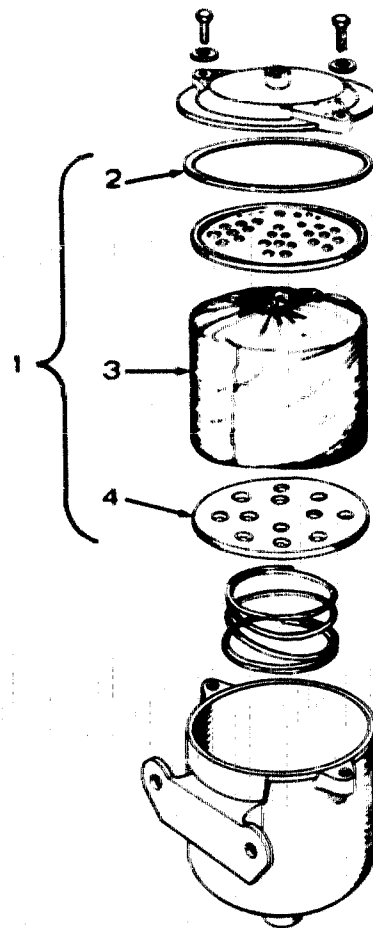


EXS-1100

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|------------------------------|-----------|--|
| 1 | CLAMP HOSE (Select) | | |
| | 503-0685 | 4 | 3/8" to 1/2" Hose Size |
| | 503-0446 | 4 | 7/16" to 3/4" Hose Size |
| | 503-0547 | 4 | 1/2" to 7/8" Hose Size |
| | 503-0183 | 4 | 9/16" to 1-1/16" Hose Size |
| | 503-0398 | 4 | 1-3/16" to 1-3/4" Hose Size |
| 2 | HOSE, RUBBER (Select) | | |
| | 503-0890 | 2 | 1/2" ID x 27/32" OD x 24" LG |
| | 503-0658 | 2 | 1/2" ID x 27/32" OD x 48" LG |
| | 503-0803 | 2 | 1/2" ID x 27/32" OD x 144" LG |
| | 503-1163 | 2 | 1" ID x 1-3/8" OD x 24" LG |
| | 503-1202 | 2 | 1" ID x 1-3/8" OD x 72" LG |
| 3 | 504-0062 | 1 | Valve, Vacuum Relief (1/2" NPT) |
| 4 | 502-0270 | 1 | Adapter, Hex - Brass (3/8" NPT x 1/2" NPT) |
| 5 | ELBOW, PIPE TO HOSE (Select) | | |
| | 502-0237 | 2 | 1/2" NPT x 3/8" ID Hose |
| | 502-0881 | 2 | 3/4" NPT x 1" ID Hose |
| 6 | TEE, PIPE - BRASS (Select) | | |
| | 502-0090 | 1 | 3/8" NPT - three places |
| | 502-0883 | 1 | 3/4" NPT x 3/4" NPT x 1/2" NPT |
| 7 | 155-1002 | 1 | Strainer, Water - Thru Hull |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|---------------------------------|-----------|-----------------------------------|
| 8 | CLAMP HOSE (Select) | | |
| | 503-0429 | 8 | 1-1/16" to 2" Hose Size |
| | 503-0365 | 8 | 1-9/16" to 2-1/2" Hose Size |
| | 503-0514 | 8 | 1-13/16" to 3" Hose Size |
| | 503-0354 | 8 | 2-1/2" to 3-1/4" Hose Size |
| | 503-0648 | 8 | 2-9/16" to 3-1/2" Hose Size |
| | 503-0612 | 8 | 3-5/16" to 4-1/4" Hose Size |
| | 503-1180 | 8 | 4" to 4-3/4" Hose Size |
| 9 | HOSE, EXHAUST - MARINE (Select) | | |
| | 503-1293 | 1 | 1-5/8" ID x 2-1/32" OD x 120" LG |
| | 503-1296 | 1 | 1-7/8" ID x 2-9/32" OD x 120" LG |
| | 503-1320 | 1 | 2" ID x 2-13/32" OD x 120" LG |
| | 503-1299 | 1 | 2-1/4" ID x 2-5/8" OD x 120" LG |
| | 503-1302 | 1 | 2-1/2" ID x 2-15/16" OD x 120" LG |
| | 503-1305 | 1 | 2-7/8" ID x 3-7/16" OD x 120" LG |
| | 503-1308 | 1 | 3-1/2" ID x 4-3/32" OD x 120" LG |
| 10 | MUFFLER, EXHAUST - MARINE | | |
| | 155-2029 | 1 | 2" OD Inlet/Outlet Tubes |
| | 155-2009 | 1 | 2-1/4" OD Inlet/Outlet Tubes |
| | 155-2010 | 1 | 2-1/2" OD Inlet/Outlet Tubes |
| | 155-2011 | 1 | 2-7/8" OD Inlet/Outlet Tubes |
| | 155-2012 | 1 | 3-1/2" OD Inlet/Outlet Tubes |

ENGINE COOLANT FILTER ASSEMBLY



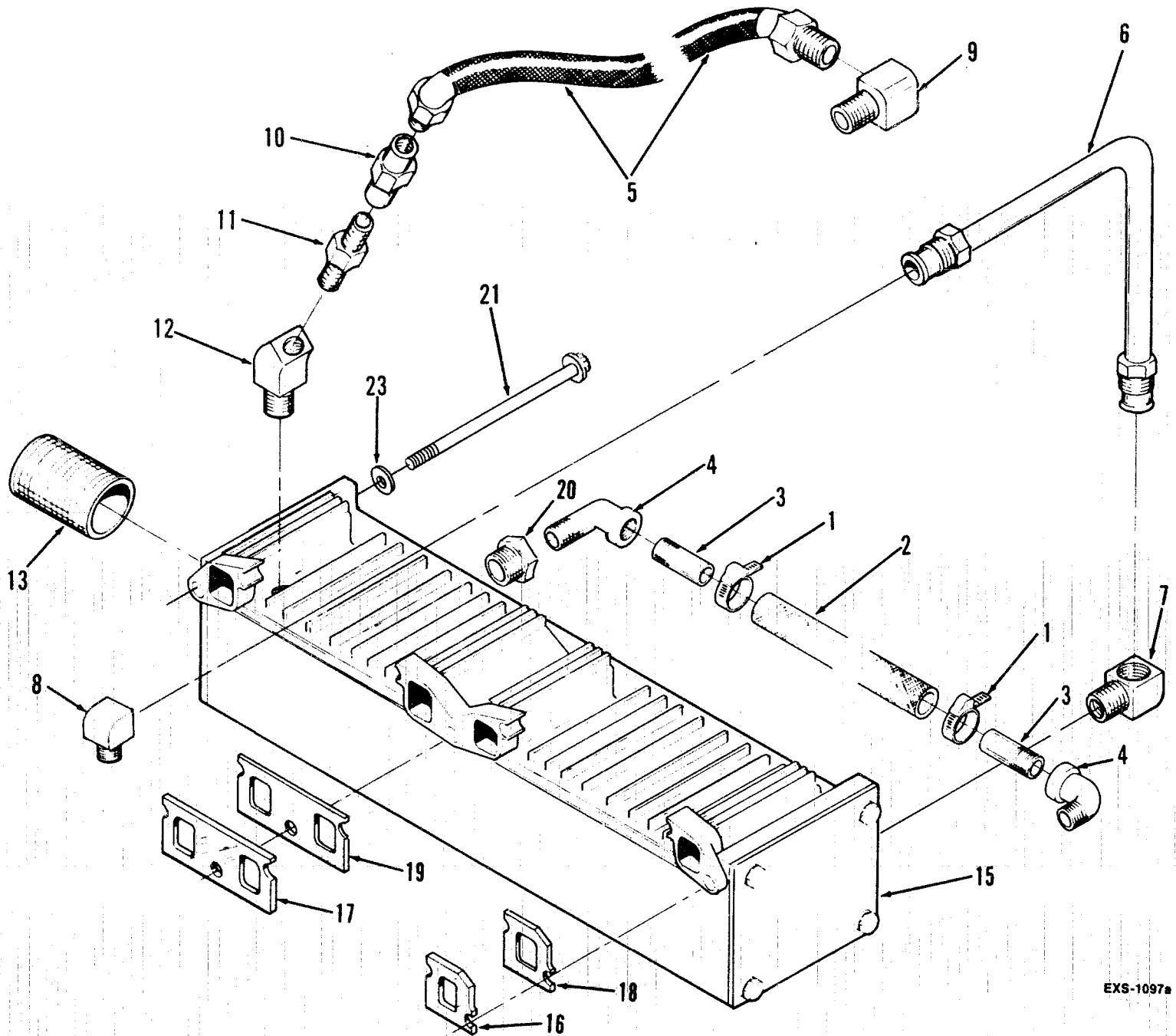
CS-1059

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|---------------------------------|--|-----------|--|
| FILTER ASSEMBLY, ENGINE COOLANT | | | |
| | 130-0462 | 1 | 15 to 30 Gallon Capacity (Replacement Items Marked £) |
| | 130-0497 | 1 | 5 to 10 Gallon Capacity (Replacement Items Marked †) |
| 1 | KIT REPLACEMENT - FILTER (Includes Items 2 Thru 4) | | |
| | 130-0769 | 1 | £Original Equipment (Water Coolant) |
| | 130-0770 | 1 | £Special (Perm. Anti-Freeze Coolant) |
| | 130-0771 | 1 | †Original Equipment (Water Coolant) |
| | 130-0772 | 1 | †Special (Perm. Anti-Freeze Coolant) |
| 2 | GASKET, COVER | | |
| | 130-0777 | 1 | £ |
| | 130-0778 | 1 | † |
| 3 | ELEMENT, FILTER | | |
| | 130-0773 | 1 | £Chromate (Water Coolant) |
| | 130-0774 | 1 | £Special (Perm. Anti-Freeze Coolant) |
| 4 | PLATE, SACRIFICIAL | | |
| | 130-0779 | 1 | £ |
| | 130-0780 | 1 | † |

£ - NOTE: Used on 130-0462 Filter Assembly

† - NOTE: Used on 130-0497 Filter Assembly

EXHAUST MANIFOLD (LIQUID COOLED)

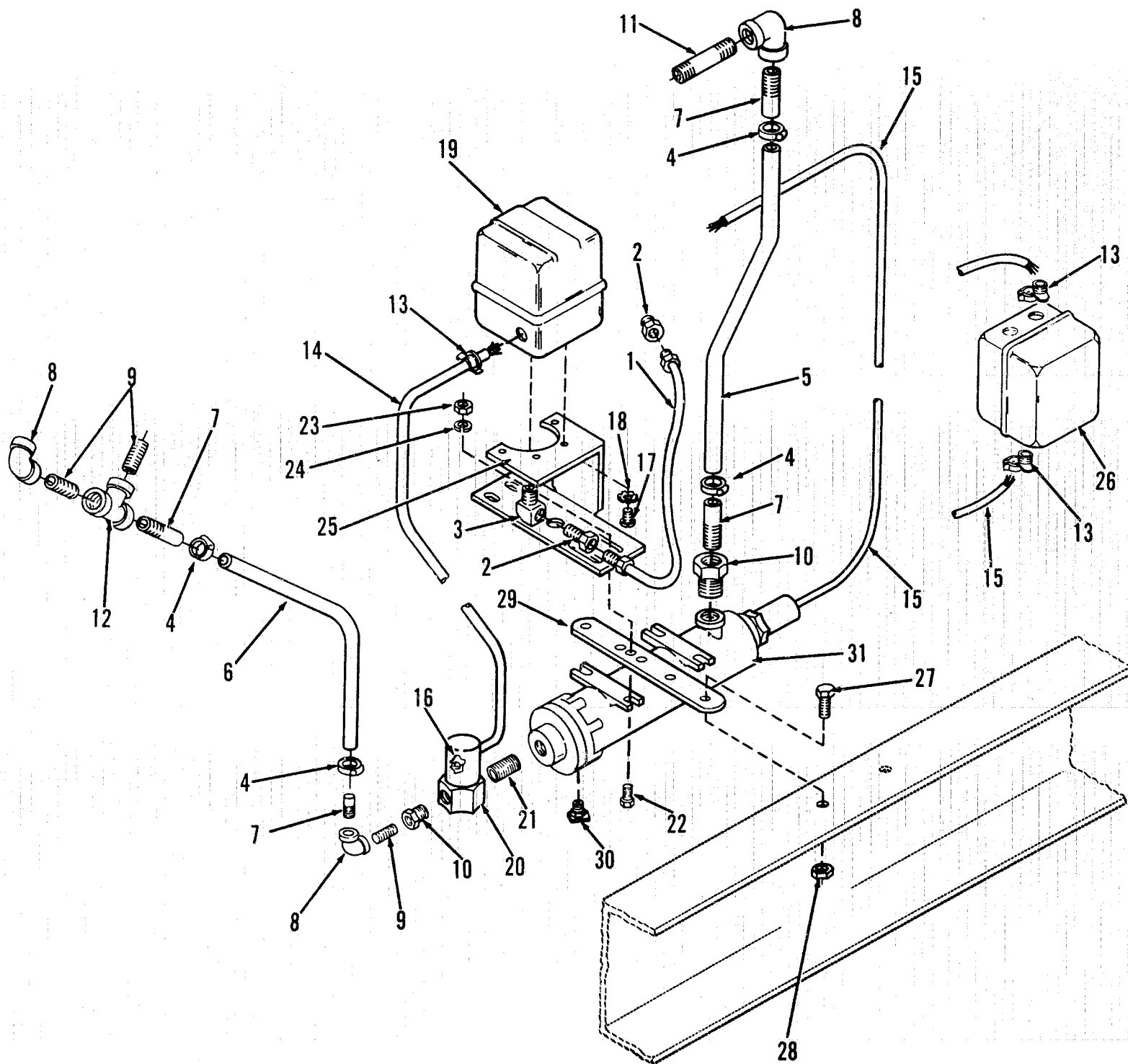


EXS-1097a

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|--|
| 1 | 503-0183 | 2 | Clamp, Hose |
| 2 | 503-0833 | 1 | Hose, Rubber (5/8" ID x 61/64" OD x 24" Lg) |
| 3 | 505-0135 | 2 | Nipple, Pipe - Half (3/8" NPT x 1-1/2" Lg) |
| 4 | 505-0120 | 2 | Elbow, Pipe - Street 90 Deg (3/8" NPT) |
| 5 | 501-0009 | 1 | Line, Fuel - Flexible (1/8 NPT Male x 1/4 SAE Male x 36" Lg) |
| 6 | 130-2225 | 1 | Line, Water |
| 7 | 502-0073 | 1 | Elbow, Pipe to Tube - 90 Deg |
| 8 | 502-0074 | 1 | Elbow, Pipe to Tube - 90 Deg |
| 9 | 502-0002 | 1 | Elbow, Pipe Street, 90 Deg (1/8 NPT) |
| 10 | 502-0051 | 1 | Coupling, Pipe - Hex (1/8 NPT x 9/16") |
| 11 | 502-0082 | 1 | Nipple, Pipe - Hex (1/8 NPT) |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|--|
| 12 | 502-0053 | 1 | Elbow, Pipe - Street 45 Deg (1/8 NPT) |
| 13 | 505-0173 | 1 | Nipple, Pipe - (2" NPT x 4" Lg) |
| 15 | 154-2415 | 1 | Manifold, Exhaust - Liquid Cooled |
| 16 | 154-2421 | 2 | Shim |
| 17 | 154-2422 | 1 | Shim |
| 18 | 154-2423 | 2 | Gasket |
| 19 | 154-2424 | 1 | Gasket |
| 20 | 505-0019 | 1 | Bushing, Reducer - Hex (1/2 NPT x 3/8 NPT) |
| 21 | 800-0063 | 3 | Screw, Cap - Hex Head (3/8-16 x 4-1/4") |
| 23 | 526-0066 | 3 | Washer, Flat (3/8") |

ENGINE COOLANT HEATER (HORIZONTAL TANK)



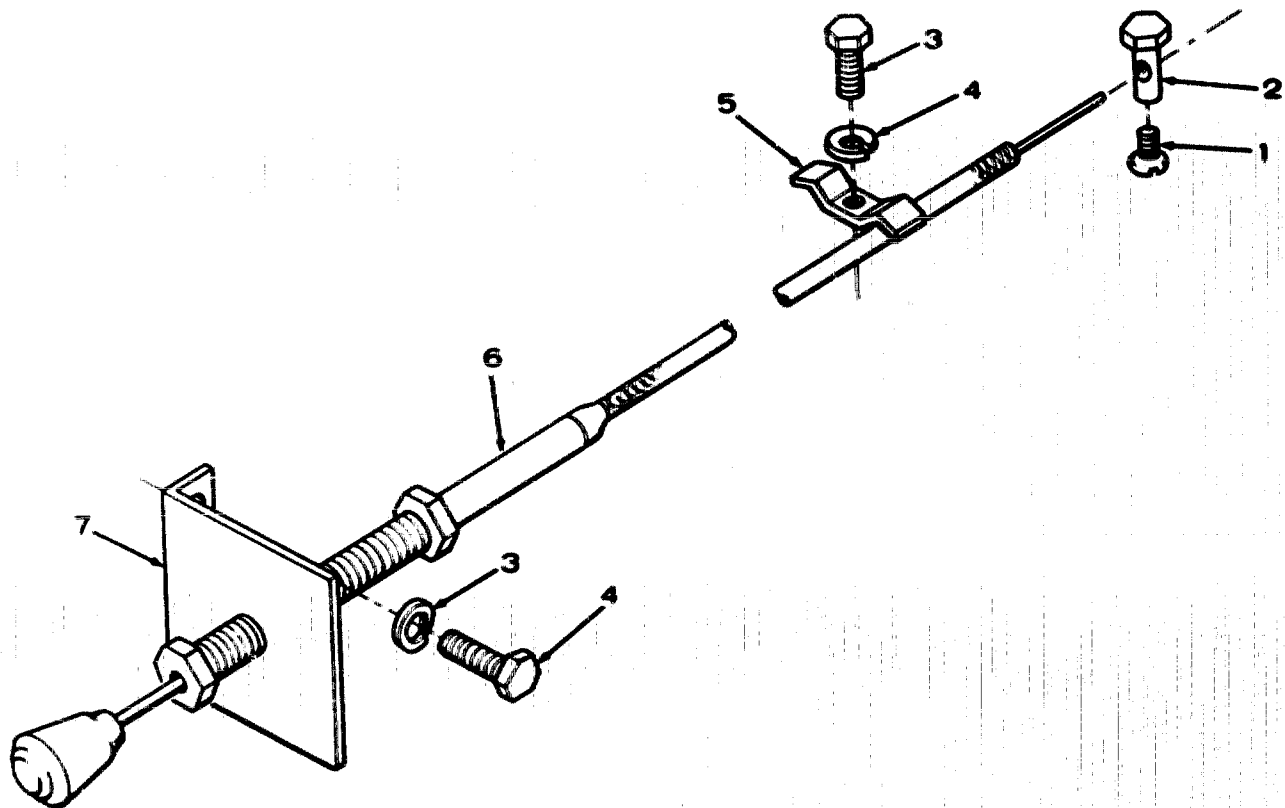
XCS-1240

ENGINE COOLANT HEATER ASSEMBLY (HORIZONTAL TANK)

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|--------------------------------|---------------------------------------|--------------|--|-------------|---|--------------|---|
| ENGINE COOLANT HEATER ASSEMBLY | | | | 16 | TERMINALS (Select as Required) | | |
| | | 1 | 115 Volt, 1 Phase | | 332-0014 | 2 | #10 (Used on White Leads) |
| | | 1 | 208 Volt, 1 Phase | | 332-0149 | 4 | #8 (Used on White Leads) |
| | | 1 | 208 Volt, 3 Phase | | 323-0957 | 4 | Wire, Nut Type (Used on Black Leads) |
| | | 1 | 240 Volt, 1 Phase | 17 | 812-0079 | 4 | Screw, Machine - Round Head (#8-32 x 1/2") |
| | | 1 | 380 Volt, 1 Phase | | | | |
| | | 1 | 380 Volt, 3 Phase | 18 | 854-0007 | 4 | Washer, Lock - ET (#8) |
| | | 1 | 480 Volt, 1 Phase | 19 | 309-0307 | 1 | Switch, Pressure |
| | | 1 | 480 Volt, 3 Phase | 20 | 309-0304 | 1 | Switch, Thermostatic |
| 1 | 501-0227 | 1 | Line, Fuel - Flexible | 21 | 505-0004 | 1 | Nipple, Pipe - Close (1"NPT x 1-1/4"Lg) |
| 2 | 505-0007 | 2 | Bushing, Reducer - Hex (1/4"NPT x 1/8"NPT) | 22 | 800-0007 | 4 | Screw, Cap - Hex Head (1/4-20 x 1") |
| 3 | 502-0054 | 1 | Elbow, Pipe - Street, 90 Deg, Brass (1/4 NPT) | 23 | 862-0001 | 4 | Nut, Hex (1/4-20) |
| 4 | 503-0183 | 4 | Clamp, Hose | 24 | 850-0040 | 4 | Washer, Lock - Spring (1/4") |
| 5 | 503-0146 | 1 | Hose, Rubber (5/8"ID x 61/64"OD x 32"Lg) | 25 | 333-0224 | 1 | Bracket, Support - Pressure Switch |
| 6 | 503-0261 | 1 | Hose, Rubber (5/8"ID x 61/64"OD x 9"Lg) | 26 | CONTACTOR, ELECTRICAL (Select as Applicable) | | |
| 7 | 505-0135 | 4 | Nipple, Pipe - Half (3/8"NPT x 1-1/2"Lg) | | 307-1460 | 1 | 230 VAC, 3 Pole |
| 8 | 505-0039 | 3 | Elbow, Pipe - 90 Deg (3/8"NPT) | | 307-1164 | 1 | 460 VAC, 3 Pole |
| 9 | 505-0101 | 3 | Nipple, Pipe - Close (3/8"NPT x 1"Lg) | 27 | 821-0018 | 4 | Screw, Self-Locking - Hex Washer Head (5/16-18 x 3/4") |
| 10 | 505-0455 | 2 | Bushing, Reducer - Hex (1"NPT x 3/8"NPT) | 28 | 870-0257 | 4 | Nut, Self-Locking, Hex Washer Head (5/16-18) |
| 11 | 505-0076 | 1 | Nipple, Pipe (3/8"NPT x 3"Lg) | 29 | 130-1191 | 2 | Bracket, Mounting - Heater |
| 12 | 505-0060 | 1 | Tee, Pipe (3/8"NPT) | 30 | 504-0003 | 1 | Cock, Drain (1/4"NPT) |
| 13 | 331-0027 | 6 | Clamp Cable | 31 | HEATER, ELECTRICAL - ENGINE COOLANT (Select as Applicable) | | |
| 14 | # | | Cord, Electrical (2-#14, Type 60, 600 Volt) | | 333-0158 | 1 | 2000 Watts, 115 Volt, 1 Phase |
| 15 | CABLE, ELECTRICAL (TYPE SO, 600 Volt) | | | | 333-0167 | 1 | 2000 Watts, 208 Volt, 1 Phase |
| | # | | 3 - #12 (Used on Single Phase Hookup) | | 333-0148 | 1 | 2000 Watts, 208 Volt, 3 Phase |
| | # | | 4 - #14 (Used on Three Phase Hookup) | | 333-0141 | 1 | 2000 Watts, 240 Volt, 3 Phase |
| | | | | | 333-0176 | 1 | 2000 Watts, 380 Volt, 1 Phase |
| | | | | | 333-0170 | 1 | 2000 Watts, 380 Volt, 3 Phase |
| | | | | | 333-0147 | 1 | 2000 Watts, 480 Volt, 1 Phase |
| | | | | | 333-0146 | 1 | 2000 Watts, 480 Volt, 3 Phase |

- Electrical Cable and Cord shown for Reference Purpose only.

VERNIER THROTTLE



M-1179

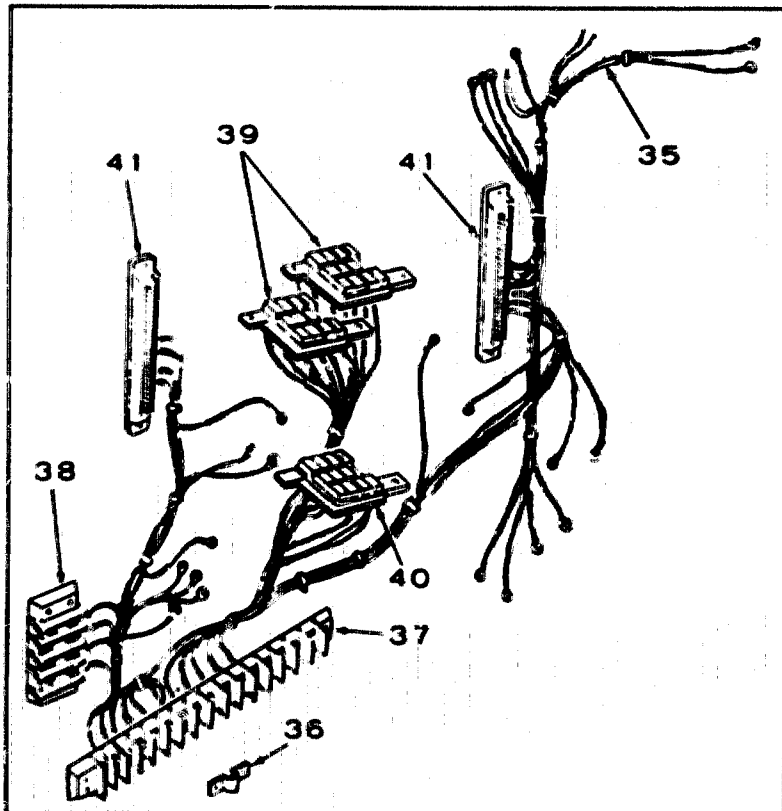
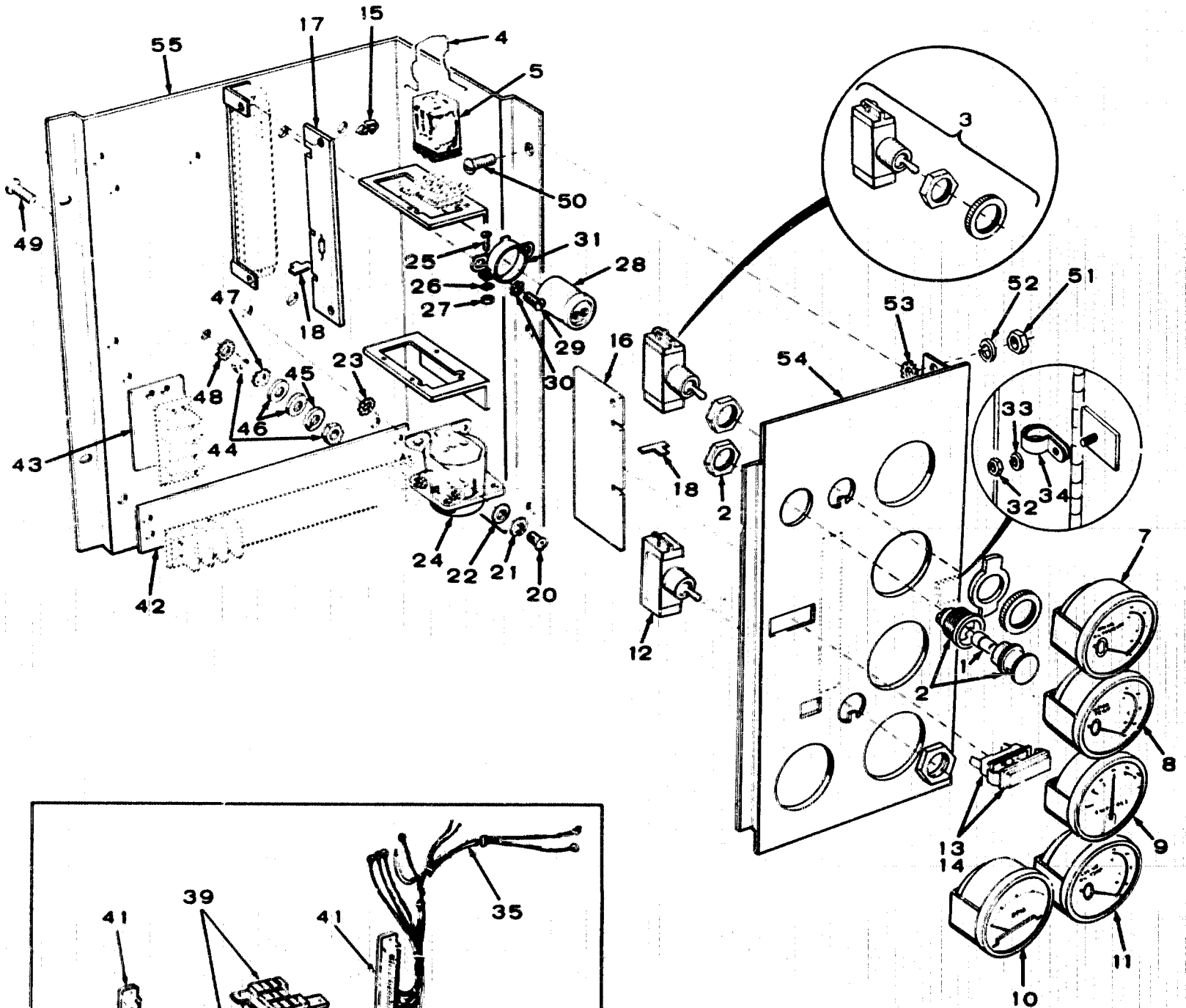
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|---|
| 1 | 812-0075 | 1 | Screw Machine - Round Head (#8-32 x 1.4") |
| 2 | 152-0158 | 1 | Swivel |
| 3 | 800-0005 | 3 | Screw Cap - Hex Head (1/4-20 x 3/4") |
| 4 | 850-0040 | 3 | Washer Lock - Spring (1/4") |
| 5 | 152-0036 | 1 | Clamp Holddown - Cable |
| 6 | 152-0120 | 1 | Throttle Control - Vernier |
| 7 | 151-0230 | 1 | Bracket Mounting - Throttle Control |

Control Section

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ENGINE CONTROL WITH ONE FAULT LIGHT (12 VDC)



8C-1147

ENGINE CONTROL WITH ONE FAULT LIGHT (12 VDC)

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--|-----------|---|
| 1 | 322-0004 | 1 | Lamp Incandescent (12 VDC) |
| 2 | 322-0149 | 1 | Lampholder |
| 3 | 308-0002 | 1 | Switch, Toggle (SPST) |
| 4 | 307-1157 | 3 | Spring, Holddown - Relay |
| 5 | RELAY (12 VDC) | | |
| | 307-1058 | 1 | (Ignition) |
| | 307-1058 | 1 | (Start Disconnect) |
| | 307-1061 | 1 | (Starter Protection) |
| 7 | 193-0243 | 1 | Gauge - Oil Pressure (12 VDC) |
| 8 | 193-0245 | 1 | Gauge - Water Temperature (12 VDC) |
| 9 | 302-0061 | 1 | Ammeter |
| 10 | 302-0749 | 1 | £Tachometer - Electrical |
| 11 | 193-0248 | 1 | £Gauge - Oil Temperature (12 VDC) |
| 12 | SWITCH, TOGGLE - SELECTOR | | |
| | 308-0138 | 1 | Standard & Cycle Cranking Controls |
| | 308-0327 | 1 | Penn State Controls |
| 13 | *LIGHT, INDICATOR (Lens Color & Legend Listed Below) | | |
| | 322-0128 | 1 | Red - Fault - 14 VDC |
| 14 | 322-0136 | 1 | *Light, Indicator - 14 VDC (Red Lens - No Legend) |
| 15 | 518-0374 | 4 | Fastener, Snap-In (Printed Circuit Boards) |
| 16 | PRINTED CIRCUIT BOARD ASSEMBLY | | |
| | 300-0733 | 1 | Standard Cranker (12 VDC) |
| | 300-0714 | 1 | Cycle Cranker (12 VDC) |
| 17 | PRINTED CIRCUIT BOARD ASSEMBLY | | |
| | 300-0679 | 1 | Engine Control Monitor - Standard |
| | 300-0730 | 1 | Engine Control Monitor - Penn State |
| 18 | 332-1276 | 4 | Plug, Keying - PC Board |
| 20 | 813-0098 | 2 | Screw, Machine - Round Head (#10-32 x 3/8") |
| 21 | 850-0030 | 2 | Washer, Lock - Spring (#10) |
| 22 | 526-0009 | 2 | Washer, Flat (7/32" ID x 1/2" OD x 1/16" Thk) |
| 23 | 856-0003 | 2 | Washer, Lock - EIT (#10) |
| 24 | 307-1031 | 1 | Relay, Solenoid - Start (12 VDC) |
| 25 | 812-0061 | 1 | Screw, Machine - Round Head (#6-32 x 3/8") |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--|-----------|---|
| 26 | 860-0006 | 1 | Nut, Hex (#6-32) |
| 27 | 853-0003 | 1 | Washer, Lock - ET (#6) |
| 28 | 356-0072 | 1 | Capacitor, Fixed Electrolytic (4000 MFD, 30 VDC) |
| 29 | 812-0063 | 2 | Screw, Machine - Round Head (#6-32 x 1/2") |
| 30 | 853-0003 | 2 | Washer, Lock - ET (#6) |
| 31 | 356-0070 | 1 | Clamp, Capacitor Mounting |
| 32 | 870-0053 | 1 | Nut, Hex (#10-32) |
| 33 | 850-0030 | 1 | Washer, Lock - Spring (#10) |
| 34 | 332-0051 | 1 | Clamp, Loop |
| 35 | HARNESS, WIRING - ENGINE CONTROL | | |
| | 338-1065 | 1 | Includes parts marked † |
| | ATTACHING HARDWARE FOR WIRING HARNESS | | |
| | 812-0061 | 4 | Screw, Machine - Round Head (#6-32 x 3/8") |
| | 812-0066 | 6 | Screw, Machine - Round Head (#6-32 x 3/4") |
| | 853-0003 | 14 | Washer, Lock - ET (#6) |
| | 860-0006 | 10 | Nut, Hex (#6-32) |
| 36 | 332-1043 | 1 | †Jumper, Terminal |
| 37 | 332-0795 | 1 | †Block, Terminal - 16 Place |
| 38 | 332-0537 | 1 | †Block, Terminal - 4 Place |
| 39 | 323-0765 | 2 | †Socket, Relay - 11 Place |
| 40 | 323-0764 | 1 | †Socket, Relay - 8 Place |
| 41 | 332-1271 | 2 | †Connector, Electrical - PC BD |
| 42 | 332-1241 | 1 | Strip, Marker - Terminal |
| 43 | 332-1239 | 1 | Strip, Marker - Terminal |
| | GROUND TERMINAL ASSEMBLY (Includes parts marked #) | | |
| 44 | 871-0010 | 2 | #Nut, Hex - Brass (#10-32) |
| 45 | 850-0030 | 1 | #Washer, Lock - Spring (#10) |
| 46 | 526-0062 | 2 | #Washer, Flat - Brass (13/64" ID x 1/2" OD x 1/16" Thk) |
| 47 | 853-0008 | 1 | #Washer, Lock - ET (#10) |
| 48 | 856-0003 | 1 | #Washer, Lock - EIT (#10) |
| 49 | 815-0203 | 1 | #Screw, Machine - Round Head, Brass (#10-32 x 7/8") |
| 50 | 815-0026 | 5 | Screw, Machine - Truss Head (#10-32 x 3/8") |
| 51 | 870-0053 | 1 | Nut, Hex (#10-32) |
| 52 | 850-0030 | 1 | Washer, Lock - Spring (#10) |
| 53 | 856-0003 | 1 | Washer, Lock - EIT (#10) |
| 54 | PANEL, CONTROL - ENGINE | | |
| | 301-3165 | 1 | With Three Gauge Mtg. Holes |
| | 301-3286 | 1 | With Four Gauge Mtg. Holes |
| | 301-3396 | 1 | With Five Gauge Mtg. Holes |
| 55 | 301-3253 | 1 | Bracket, Mounting Engine Control |

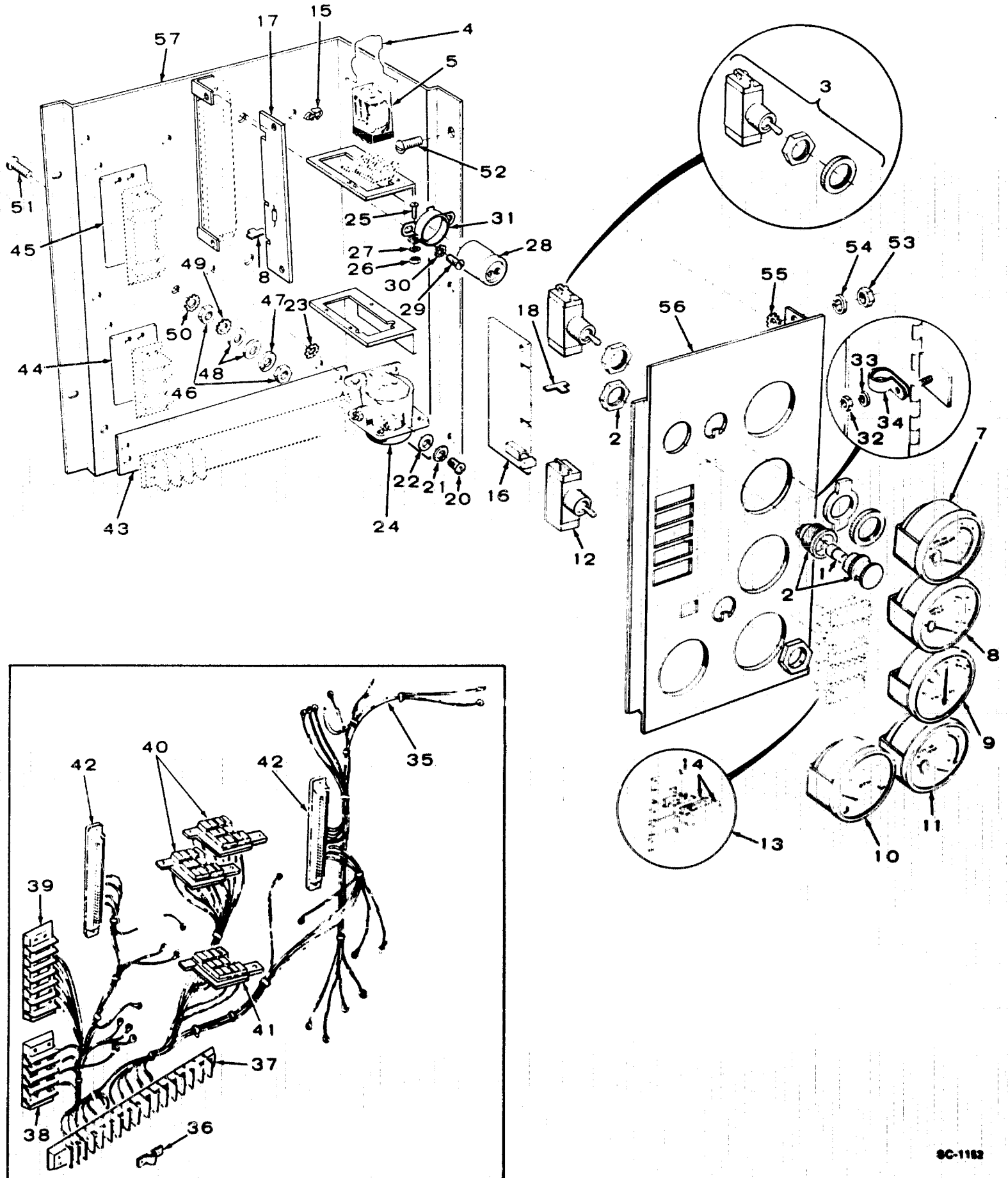
* - **NOTE:** For lamp replacement order 322-0136 remove and discard plain red lens, install lens with legend from burned out light — lights/snap in and out of panel.

£ - Optional items used with Engine Mounted Senders.

† - Parts includes in Wiring Harness

- Parts includes in Ground Terminal Assembly

ENGINE CONTROL WITH FIVE FAULT LIGHTS (12 VDC)



9C-1162

ENGINE CONTROL WITH FIVE FAULT LIGHTS (12 VDC)

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|---|-----------|---|
| 1 | 322-0004 | 1 | Lamp Incandescent (12 VDC) |
| 2 | 322-0149 | 1 | Lampholder |
| 3 | 308-0002 | 1 | Switch, Toggle (SPST) |
| 4 | 307-1157 | 3 | Spring, Holddown - Relay |
| 5 | RELAY (12 VDC) | | |
| | 307-1058 | 1 | (Ignition) |
| | 307-1058 | 1 | (Start Disconnect) |
| | 307-1061 | 1 | (Starter Protection) |
| 7 | 193-0243 | 1 | Gauge - Oil Pressure (12 VDC) |
| 8 | 193-0245 | 1 | Gauge - Water Temperature (12 VDC) |
| 9 | 302-0061 | 1 | Ammeter |
| 10 | 302-0749 | 1 | £Tachometer - Electrical |
| 11 | 193-0248 | 1 | £Gauge - Oil Temperature (12 VDC) |
| 12 | SWITCH, TOGGLE - SELECTOR | | |
| | 308-0138 | 1 | Standard & Cycle Cranking Controls |
| | 308-0327 | 1 | Penn State Controls |
| 13 | *LIGHT, INDICATOR-14 VDC (Lens Color & Legend Listed Below) | | |
| | 322-0107 | 1 | Red - OVERCRANK |
| | 322-0111 | 1 | Red - OVERSPEED |
| | 322-0108 | 1 | Red - LO OIL PRESS |
| | 322-0109 | 1 | Red - HI ENG TEMP |
| | 322-0110 | 2 | Red - LO ENG TEMP |
| 14 | 322-0136 | 1 | *Light, Indicator - 14 VDC (Red Lens - No Legend) |
| 15 | 518-0374 | 4 | Fastener, Snap-In (Printed Circuit Boards) |
| 16 | PRINTED CIRCUIT BOARD ASSEMBLY | | |
| | 300-0733 | 1 | Standard Cranker (12 VDC) |
| | 300-0714 | 1 | Cycle Cranker (12 VDC) |
| 17 | PRINTED CIRCUIT BOARD ASSEMBLY | | |
| | 300-0681 | 1 | Engine Control Monitor - Standard |
| 18 | 332-1276 | 4 | Plug, Keying - PC Board |
| 20 | 813-0098 | 2 | Screw, Machine - Round Head (#10-32 x 3/8") |
| 21 | 850-0030 | 2 | Washer, Lock - Spring (#10) |
| 22 | 526-0009 | 2 | Washer, Flat (7/32" ID x 1/2" OD x 1/16" Thk) |
| 23 | 856-0003 | 2 | Washer, Lock - EIT (#10) |
| 24 | 307-1031 | 1 | Relay, Solenoid - Start (12 VDC) |
| 25 | 812-0061 | 1 | Screw, Machine - Round Head (#6-32 x 3/8") |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--|-----------|---|
| 26 | 860-0006 | 1 | Nut, Hex (#6-32) |
| 27 | 853-0003 | 1 | Washer, Lock - ET (#6) |
| 28 | 356-0072 | 1 | Capacitor, Fixed Electrolytic (4000 MFD, 30 VDC) |
| 29 | 812-0063 | 2 | Screw, Machine - Round Head (#6-32 x 1/2") |
| 30 | 853-0003 | 2 | Washer, Lock - ET (#6) |
| 31 | 356-0070 | 1 | Clamp, Capacitor Mounting |
| 32 | 870-0053 | 1 | Nut, Hex (#10-32) |
| 33 | 850-0030 | 1 | Washer, Lock - Spring (#10) |
| 34 | 332-0051 | 1 | Clamp, Loop |
| 35 | HARNESS, WIRING - ENGINE CONTROL | | |
| | 338-1066 | 1 | Includes Parts Marked † |
| | ATTACHING HARDWARE FOR WIRING HARNESS | | |
| | 812-0063 | 6 | Screw, Machine - Round Head (#6-32 x 1/2") |
| | 812-0066 | 6 | Screw, Machine - Round Head (#6-32 x 3/4") |
| | 853-0003 | 14 | Washer, Lock - ET (#6) |
| | 860-0006 | 10 | Nut, Hex (#6-32) |
| 36 | 332-1043 | 1 | †Jumper, Terminal |
| 37 | 332-0795 | 1 | †Block, Terminal - 20 Place |
| 38 | 332-0537 | 1 | †Block, Terminal - 4 Place |
| 39 | 332-0699 | 1 | †Block, Terminal - 6 Place |
| 40 | 323-0765 | 2 | †Socket, Relay - 11 Place |
| 41 | 323-0764 | 2 | †Socket, Relay - 8 Place |
| 42 | 332-1271 | 1 | †Connector, Electrical - PC BD |
| 43 | 332-1559 | 1 | Strip, Marker - Terminal |
| 44 | 332-1239 | 1 | Strip, Marker - Terminal |
| 45 | 332-1240 | 1 | Strip, Marker - Terminal |
| | GROUND TERMINAL ASSEMBLY (Includes Parts Marked #) | | |
| 46 | 871-0010 | 2 | #Nut, Hex - Brass (#10-32) |
| 47 | 850-0030 | 1 | #Washer, Lock - Spring (#10) |
| 48 | 526-0062 | 2 | #Washer, Flat - Brass (13/64" ID x 1/2" OD x 1/16" Thk) |
| 49 | 853-0008 | 1 | #Washer, Lock - ET (#10) |
| 50 | 856-0003 | 1 | #Washer, Lock - EIT (#10) |
| 51 | 815-0203 | 1 | #Screw, Machine - Round Head, Brass (#10-32 x 7/8") |
| 52 | 815-0026 | 5 | Screw, Machine - Truss Head (#10-32 x 3/8") |
| 53 | 870-0053 | 1 | Nut, Hex (#10-32) |
| 54 | 850-0030 | 1 | Washer, Lock - Spring (#10) |
| 55 | 856-0003 | 1 | Washer, Lock - EIT (#10) |
| 56 | PANEL, CONTROL - ENGINE | | |
| | 301-3267 | 1 | With Three Gauge Mtg. Holes |
| | 301-3286 | 1 | With Four Gauge Mtg. Holes |
| | 301-3166 | 1 | With Five Gauge Mtg. Holes |
| 57 | 301-3253 | 1 | Bracket, Mounting Engine Control |

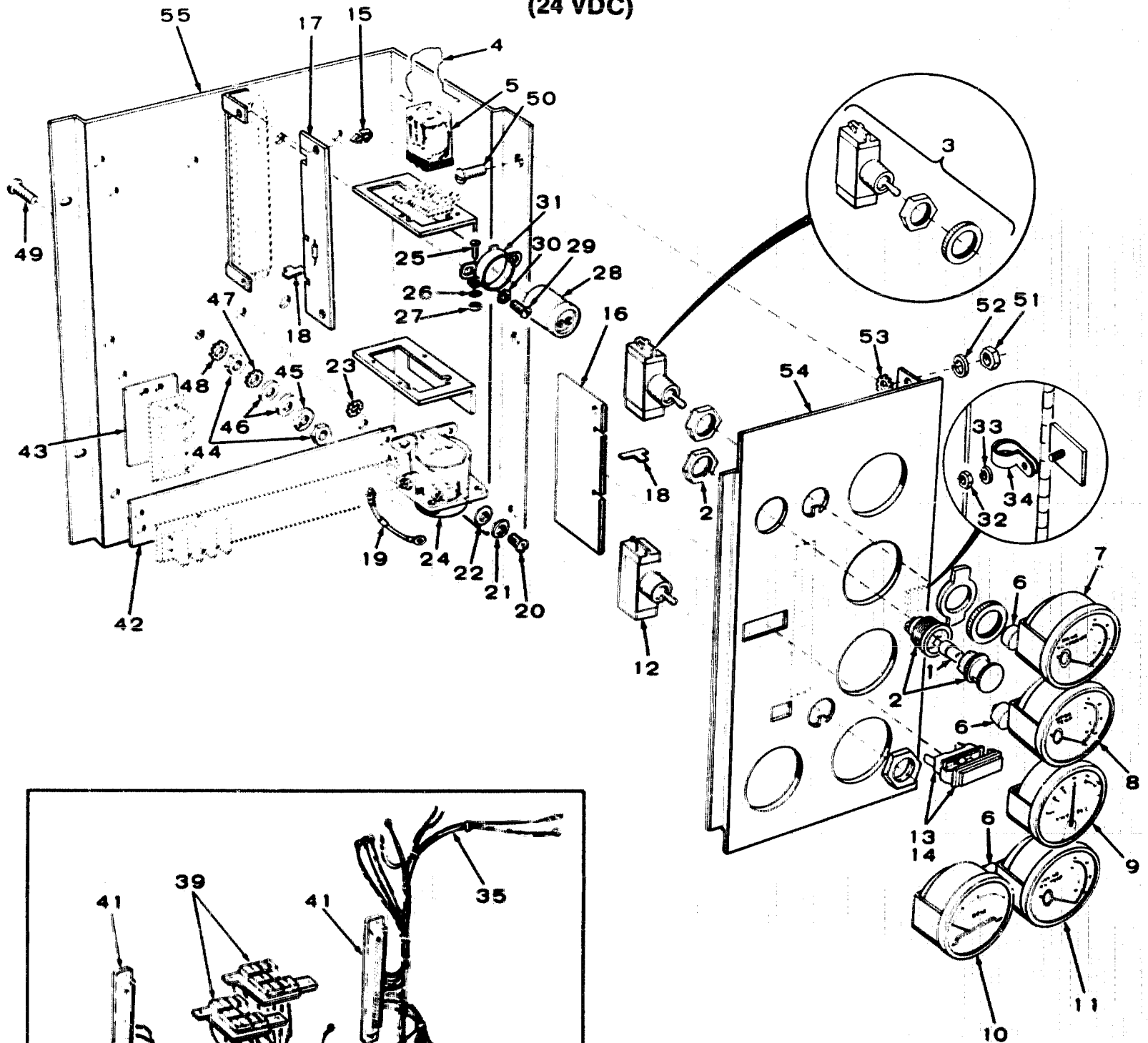
* - NOTE: For lamp replacement order 322-0136 remove and discard plain red lens, install lens with legend from burned out light. — lights snap in and out of panel.

£ - Optional items used with Engine Mounted Senders.

† - Parts included in Wiring Harness

- Parts included in Ground Terminal Assembly

ENGINE CONTROL WITH ONE FAULT LIGHT (24 VDC)



SC-1166

ENGINE CONTROL WITH ONE FAULT LIGHT (24 VDC)

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--|-----------|---|----------|--|-----------|---|
| 1 | 322-0017 | 1 | Lamp Incandescent (24 VDC) | 26 | 860-0006 | 1 | Nut, Hex (#6-32) |
| 2 | 322-0149 | 1 | Lampholder | 27 | 853-0003 | 1 | Washer, Lock - ET (#6) |
| 3 | 308-0002 | 1 | Switch, Toggle (SPST) | 28 | 356-0072 | 1 | Capacitor, Fixed, Electrolytic (4000 MFD, 30 VDC) |
| 4 | 307-1157 | 3 | Spring, Holddown - Relay | 29 | 812-0063 | 2 | Screw, Machine - Round Head (#6-32 x 1/2") |
| 5 | RELAY (24 VDC) | | | 30 | 853-0003 | 2 | Washer, Lock - ET (#6) |
| | 307-1056 | 1 | (Ignition) | 31 | 356-0070 | 1 | Clamp, Capacitor Mounting |
| | 307-1056 | 1 | (Start Disconnect) | 32 | 870-0053 | 1 | Nut, Hex (#10-32) |
| | 307-1061 | 1 | (Starter Protection) | 33 | 850-0030 | 1 | Washer, Lock - Spring (#10) |
| 6 | 193-0250 | 3 | Resistor - Gauge | 34 | 332-0051 | 1 | Clamp, Loop |
| 7 | 193-0243 | 1 | Gauge - Oil Pressure (12 VDC) | 35 | HARNESS, WIRING - ENGINE CONTROL | | |
| 8 | 193-0245 | 1 | Gauge - Water Temperature (12 VDC) | | 338-1065 | 1 | Includes Parts Marked † |
| 9 | 302-0061 | 1 | Ammeter | | ATTACHING HARDWARE FOR WIRING HARNESS | | |
| 10 | 302-0749 | 1 | £Tachometer - Electrical | | 812-0061 | 4 | Screw Machine - Round Head (#6-32 x 3/8") |
| 11 | 193-0248 | 1 | £Gauge - Oil Temperature (12 VDC) | | 812-0066 | 6 | Screw, Machine - Round Head (#6-32 x 3/4") |
| 12 | SWITCH, TOGGLE - SELECTOR | | | | 853-0003 | 14 | Washer, Lock - ET (#6) |
| | 308-0138 | 1 | Standard & Cycle Cranking Controls | | 860-0006 | 10 | Nut, Hex (#6-32) |
| | 308-0327 | 1 | Penn State Controls | 36 | 332-1043 | 1 | †Jumper, Terminal |
| 13 | *LIGHT, INDICATOR (Lens Color & Legend Listed Below) | | | 37 | 332-0795 | 1 | †Block, Terminal - 16 Place |
| | 322-0129 | 1 | Red - Fault - 28 VDC | 38 | 332-0537 | 1 | †Block, Terminal - 4 Place |
| 14 | 322-0137 | 1 | *Light, Indicator - 28 VDC (Red Lens - No Legend) | 39 | 323-0765 | 2 | †Socket, Relay - 11 Place |
| 15 | 518-0374 | 4 | Fastener, Snap-In (Printed Circuit Boards) | 40 | 323-0764 | 1 | †Socket, Relay - 8 Place |
| 16 | PRINTED CIRCUIT BOARD ASSEMBLY | | | 41 | 332-1271 | 2 | †Connector, Electrical - PC BD |
| | 300-0751 | 1 | Standard Cranker (24 VDC) | 42 | 332-1241 | 1 | Strip, Marker - Terminal |
| | 300-0715 | 1 | Cycle Cranker (24 VDC) | 43 | 332-1239 | 1 | Strip, Marker - Terminal |
| 17 | PRINTED CIRCUIT BOARD ASSEMBLY | | | | GROUND TERMINAL ASSEMBLY (Includes Parts Marked #) | | |
| | 300-0680 | 1 | Engine Control Monitor - Standard | 44 | 871-0010 | 2 | #Nut, Hex - Brass (#10-32) |
| | 300-0731 | 1 | Engine Control Monitor - Penn State | 45 | 850-0030 | 1 | #Washer, Lock - Spring (#10) |
| 18 | 332-1276 | 4 | Plug, Keying - PC Board | 46 | 526-0062 | 2 | #Washer, Flat - Brass (13/64" ID 1/2" OD x 1/16" Thk) |
| 19 | 357-0018 | 1 | Diode, with Terminals | 47 | 853-0008 | 1 | #Washer, Lock - ET (#10) |
| 20 | 813-0098 | 2 | Screw, Machine - Round Head (#10-32 x 3/8") | 48 | 856-0003 | 1 | #Washer, Lock - ET (#10) |
| 21 | 850-0030 | 2 | Washer, Lock - Spring (#10) | 49 | 815-0203 | 1 | #Screw, Machine - Round head, Brass (#10-32 x 7/8") |
| 22 | 526-0009 | 2 | Washer, Flat (7/32" ID x 1/2" OD x 1/16" Thk) | 50 | 815-0026 | 5 | Screw, Machine - Truss Head (#10-32 x 3/8") |
| 23 | 856-0003 | 2 | Washer, Lock - EIT (#10) | 51 | 870-0053 | 1 | Nut, Hex (#10-32) |
| 24 | 307-0061 | 1 | Relay, Solenoid - Start (24 VDC) | 52 | 850-0030 | 1 | Washer, Lock - Spring (#10) |
| 25 | 812-0061 | 1 | Screw, Machine - Round Head (#6-32 x 3/8") | 53 | 856-0003 | 1 | Washer, Lock - EIT (#10) |
| | | | | 54 | PANEL CONTROL - ENGINE | | |
| | | | | | 301-3165 | 1 | With Three Gauge Mtg. Holes |
| | | | | | 301-3286 | 1 | With Four Gauge Mtg. Holes |
| | | | | | 301-3396 | 1 | With Five Gauge Mtg. Holes |
| | | | | 55 | 301-3253 | 1 | Bracket, Mounting Engine Control |

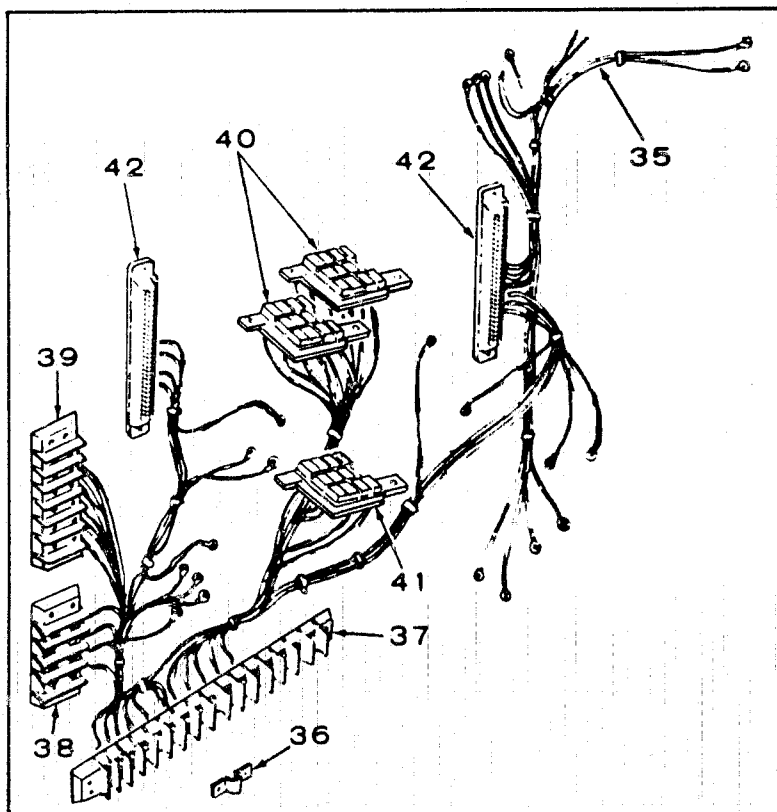
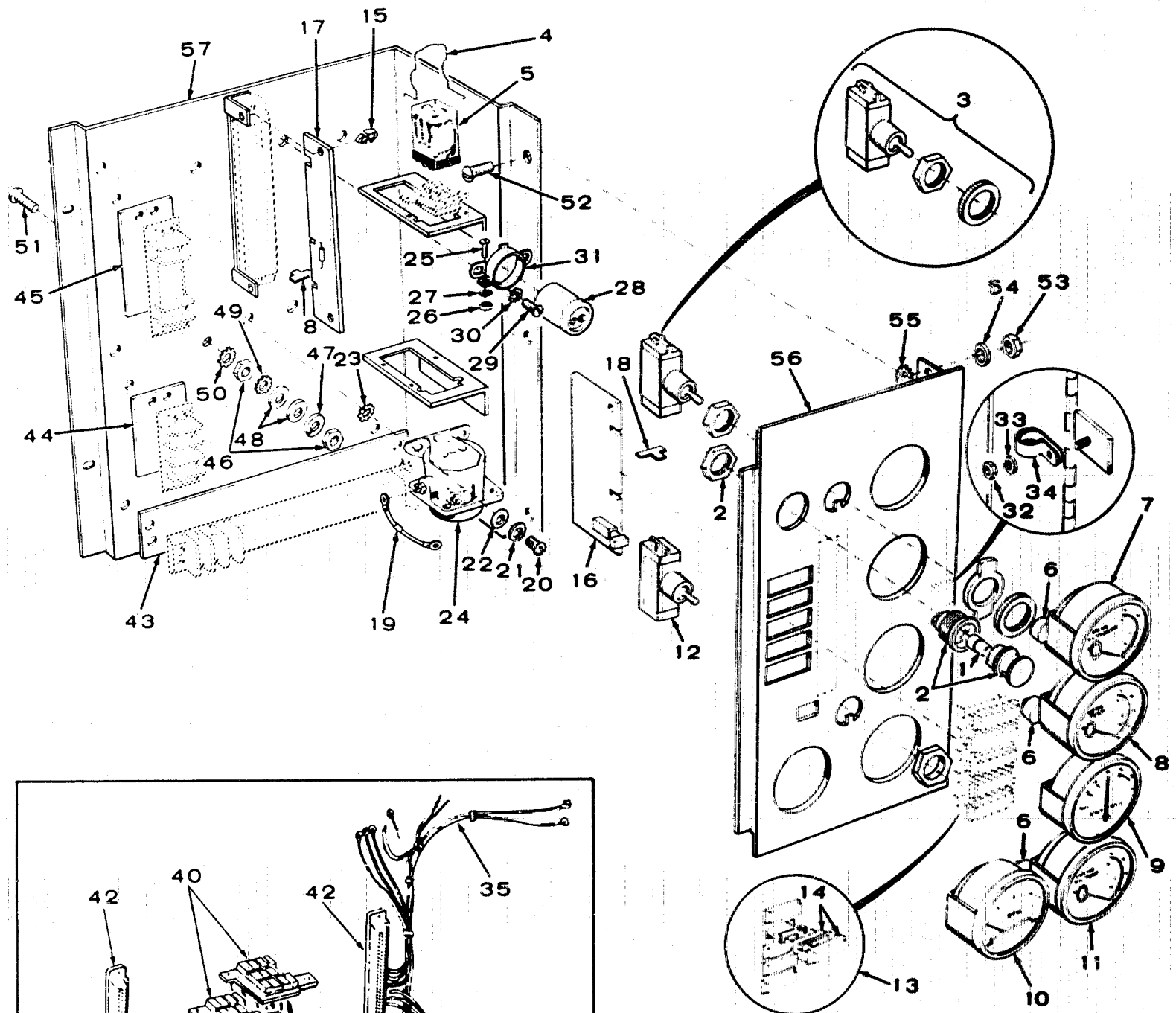
* - **NOTE:** For lamp replacement order 322-0137 remove and discard plain red lens, install lens with legend from burned out light —

£ - Optional items used with Engine Mounted Senders.

+ - Parts included in Wiring Harness.

- Parts included in Ground Terminal Assembly.

ENGINE CONTROL WITH FIVE FAULT LIGHTS (24 VDC)



XSC-1185

ENGINE CONTROL WITH FIVE FAULT LIGHTS (24 VDC)

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | |
|----------|---|-----------|---|--|----------------------------------|--|---|--|
| 1 | 322-0017 | 1 | Lamp Incandescent (24 VDC) | 26 | 860-0006 | 1 | Nut, Hex (#6-32) | |
| 2 | 322-0149 | 1 | Lampholder | 27 | 853-0003 | 1 | Washer, Lock - ET (#6) | |
| 3 | 308-0002 | 1 | Switch, Toggle (SPST) | 28 | 356-0072 | 1 | Capacitor, Fixed, Electrolytic (4000 MFD, 30 VDC) | |
| 4 | 307-1157 | 3 | Spring, Holddown - Relay | 29 | 812-0063 | 2 | Screw, Machine - Round Head (#6-32 x 1/2") | |
| 5 | RELAY (24 VDC) | | | 30 | 853-0003 | 2 | Washer, Lock - ET (#6) | |
| | 307-1056 | 1 | (Ignition) | 31 | 356-0070 | 1 | Clamp, Capacitor Mounting | |
| | 307-1056 | 1 | (Start Disconnect) | 32 | 870-0053 | 1 | Nut, Hex (#10-32) | |
| | 307-1061 | 1 | (Starter Protection) | 33 | 850-0030 | 1 | Washer, Lock - Spring (#10) | |
| 6 | 193-0250 | 3 | Resistor - Gauge | 34 | 332-0051 | 1 | Clamp, Loop | |
| 7 | 193-0243 | 1 | Gauge - Oil Pressure (12 VDC) | 35 | HARNESS, WIRING - ENGINE CONTROL | | | |
| 8 | 193-0245 | 1 | Gauge - Water Temperature (12 VDC) | 338-1066 | 1 | Includes Parts Marked † | | |
| 9 | 302-0061 | 1 | Ammeter | ATTACHING HARDWARE FOR WIRING HARNESS | | | | |
| 10 | 302-0749 | 1 | £Tachometer - Electrical | 812-0063 | 6 | Screw, Machine - Round Head (#6-32 x 1/2") | | |
| 11 | 193-0248 | 1 | £Gauge - Oil Temperature (12 VDC) | 812-0066 | 6 | Screw, Machine - Round Head (#6-32 x 3/4") | | |
| 12 | SWITCH, TOGGLE - SELECTOR | | | 853-0003 | 14 | Washer, Lock - ET (#6) | | |
| | 308-0138 | 1 | Standard & Cycle Cranking Controls | 860-0006 | 10 | Nut, Hex (#6-32) | | |
| | 308-0327 | 1 | Penn State Controls | 36 | 332-1043 | 1 | †Jumper Terminal | |
| 13 | *LIGHT, INDICATOR - 28 VDC (Lens Color & Legend Listed Below) | | | 37 | 332-0795 | 1 | †Block, Terminal - 20 Place | |
| | 322-0119 | 1 | Red - OVERCRANK | 38 | 332-0537 | 1 | †Block, Terminal - 4 Place | |
| | 322-0123 | 1 | Red - OVERSPEED | 39 | 332-0699 | 1 | †Block, Terminal - 6 Place | |
| | 322-0120 | 1 | Red - LO OIL PRESS | 40 | 323-0765 | 2 | †Socket, Relay - 11 Place | |
| | 322-0121 | 1 | Red - HI ENG TEMP | 41 | 323-0764 | 2 | †Socket, Relay - 8 Place | |
| | 322-0122 | 1 | Red - LO ENG TEMP | 42 | 332-1271 | 1 | Connector, Electrical - PC BD | |
| 14 | 322-0137 | 1 | *Light, Indicator - 28 VDC (Red Lens - No Legend) | 43 | 332-1559 | 1 | Strip, Marker - Terminal | |
| 15 | 518-0374 | 4 | Fastener, Snap-In (Printed Circuit Boards) | 44 | 332-1239 | 1 | Strip, Marker - Terminal | |
| 16 | PRINTED CIRCUIT BOARD ASSEMBLY | | | 45 | 332-1240 | 1 | Strip, Marker - Terminal | |
| | 300-0751 | 1 | Standard Cranker (24 VDC) | GROUND TERMINAL ASSEMBLY (Includes Parts Marked #) | | | | |
| | 300-0715 | 1 | Cycle Cranker (24 VDC) | 46 | 871-0010 | 2 | #Nut, Hex - Brass (#10-32) | |
| 17 | PRINTED CIRCUIT BOARD ASSEMBLY | | | 47 | 850-0030 | 1 | #Washer, Lock - Spring (#10) | |
| | 300-0682 | 1 | Engine Control Monitor - Standard | 48 | 526-0062 | 2 | #Washer, Flat - Brass (13/64" ID x 1/2" OD x 1/16" Thk) | |
| 18 | 332-1276 | 4 | Plug, Keying - PC Board | 49 | 853-0008 | 1 | #Washer, Lock - ET (#10) | |
| 19 | 357-0018 | 1 | Diode, with Terminals | 50 | 856-0003 | 1 | #Washer, Lock - EIT (#10) | |
| 20 | 813-0098 | 2 | Screw, Machine - Round Head (#10-32 x 3/8") | 51 | 815-0203 | 1 | #Screw, Machine - Round Head, Brass (#10-32 x 7/8") | |
| 21 | 850-0030 | 2 | Washer, Lock - Spring (#10) | 52 | 815-0026 | 5 | Screw, Machine - Truss Head (#10-32 x 3/8") | |
| 22 | 526-0009 | 2 | Washer, Flat (7/32" ID x 1/2" OD x 1/16" Thk) | 53 | 870-0053 | 1 | Nut, Hex (#10-32) | |
| 23 | 856-0003 | 2 | Washer, Lock - EIT (#10) | 54 | 850-0030 | 1 | Washer, Lock - Spring (#10) | |
| 24 | 307-0061 | 1 | Relay, Solenoid - Start (24 VDC) | 55 | 856-0003 | 1 | Washer, Lock - EIT (#10) | |
| 25 | 812-0061 | 1 | Screw, Machine - Round Head (#6-32 x 3/8") | 56 | PANEL, CONTROL - ENGINE | | | |
| | | | | 301-3267 | 1 | With Three Gauge Mtg. Holes | | |
| | | | | 301-3286 | 1 | With Four Gauge Mtg. Holes | | |
| | | | | 301-3166 | 1 | With Five Gauge Mtg. Holes | | |
| | | | | 57 | 301-3253 | 1 | Bracket, Mounting - Engine Control | |

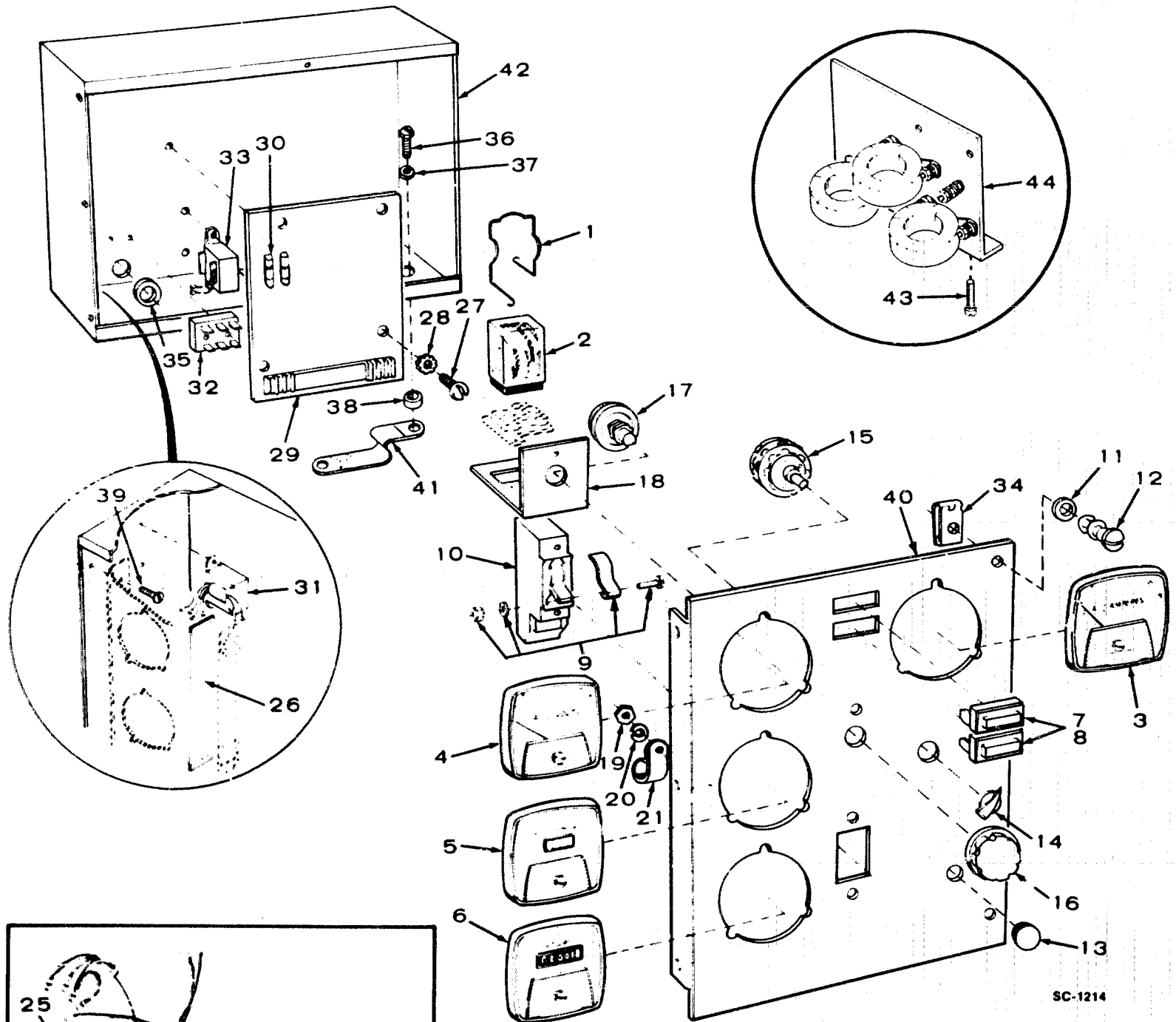
* - **NOTE:** For lamp replacement order 322-0137 remove and discard plain red lens, install lens with legend from burned out light — lights snap in and out of panel.

£ - Optional items used with Engine Mounted Senders.

† - Parts Included in Wiring Harness.

- Parts Included in Ground Terminal Assembly.

GENERATOR CONTROL



SC-1214

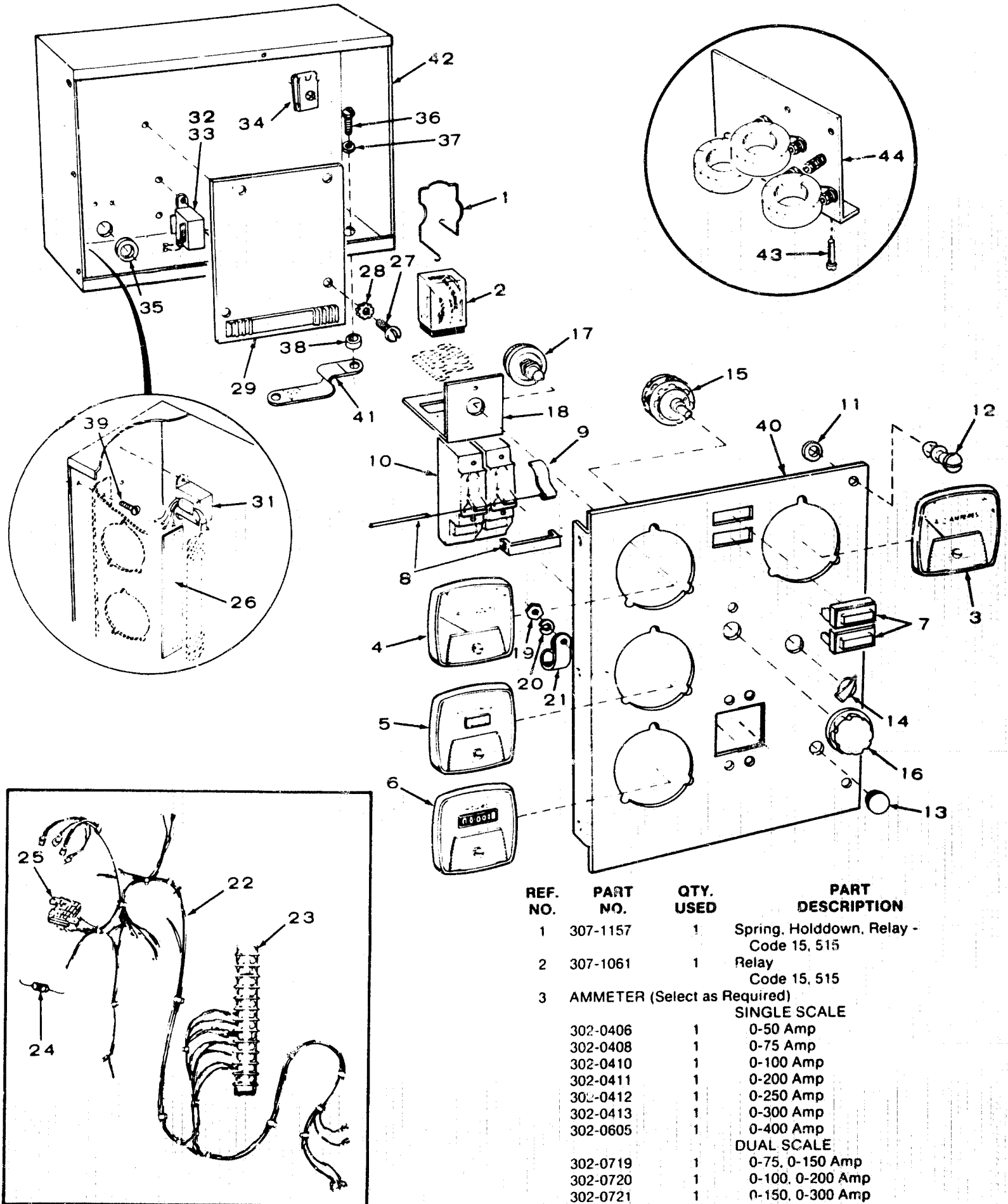
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|------------------------------|-----------|-------------------------|
| 1 | 307-1157 | 1 | Spring, Holddown, Relay |
| 2 | 307-1061 | 1 | Relay |
| 3 | AMMETER (Select as Required) | | |
| | | | SINGLE SCALE |
| | 302-0406 | 1 | 0-50 Amp |
| | 302-0408 | 1 | 0-75 Amp |
| | 302-0410 | 1 | 0-100 Amp |
| | 302-0411 | 1 | 0-200 Amp |
| | 302-0412 | 1 | 0-250 Amp |
| | 302-0413 | 1 | 0-300 Amp |
| | 302-0605 | 1 | 0-400 Amp |
| | | | DUAL SCALE |
| | 302-0719 | 1 | 0-75, 0-150 Amp |
| | 302-0720 | 1 | 0-100, 0-200 Amp |
| | 302-0721 | 1 | 0-150, 0-300 Amp |
| | 302-0722 | 1 | 0-200, 0-400 Amp |
| | 302-0723 | 1 | 0-250, 0-500 Amp |
| | 302-0724 | 1 | 0-375, 0-750 Amp |

GENERATOR CONTROL

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|---|-----------|-----------------------------------|
| 4 | VOLTMETER (Select as Required) | | |
| | | | SINGLE SCALE |
| | 302-0421 | 1 | 0-300 Volt |
| | 302-0422 | 1 | 0-600 Volt |
| | 302-0612 | 1 | 0-500 Volt |
| | 302-0779 | 1 | 0-750 Volt |
| | | | DUAL SCALE |
| | 302-0718 | 1 | 0-300, 0-600 Volt |
| 5 | METER, FREQUENCY (Select as Required) | | |
| | | | REED TYPE |
| | 302-0213 | 1 | 115 VAC, 60 Hz |
| | 302-0221 | 1 | 230 VAC, 60 Hz |
| | 302-0234 | 1 | 115 VAC, 50 Hz |
| | 302-0256 | 1 | 230 VAC, 50 Hz |
| | | | POINTER TYPE |
| | 302-0809 | 1 | 120 VAC, 60 Hz |
| | 302-0810 | 1 | 208 VAC, 60 Hz |
| | 302-0811 | 1 | 240 VAC, 60 Hz |
| 6 | METER, TIME TOTALIZING (Select as Required) | | |
| | 302-0466 | 1 | 60 Hz |
| | 302-0469 | 1 | 50 Hz |
| 7 | LIGHT, INDICATOR - 125 VAC (Lens Color & Legend Listed Below) | | |
| | 322-0130 | 1 | Red - Lower Scale |
| | 322-0131 | 1 | Red - Upper Scale |
| 8 | 322-0178 | 1 | Light, Indicator - 125 VAC |
| | (Replacement) - Discard Lens - Used Lens From Original Light | | |
| 9 | 320-0307 | 1 | Lock - Circuit Breaker Handle |
| | (Penn State Sets) | | |
| | ATTACHING HARDWARE FOR LOCK | | |
| | 815-0203 | 1 | Screw, Machine - Round Head |
| | | | (#10-32 x 7/8") |
| | 854-0010 | 1 | Washer, Lock - IT (#10) |
| | 871-0010 | 1 | Nut, Hex (#10-32) |
| 10 | 320-0431 | 1 | Circuit Breaker |
| | ATTACHING HARDWARE FOR CIRCUIT BREAKER | | |
| | 812-0061 | 2 | Screw, Machine - Round Head |
| | | | (#6-32 x 3/8") |
| | 850-0020 | 2 | Washer, Lock - Spring (#6) |
| | 815-0203 | 1 | Screw, Machine - Round Head, |
| | | | Brass (#10-32 x 7/8") |
| | 871-0010 | 1 | Nut, Hex - Brass (#10-32) |
| | 853-0008 | 1 | Washer, Lock - ET (#10) |
| | 526-0049 | 1 | Washer, Flat - Brass (13/64" ID x |
| | | | 7/16" OD x 132" Thk) |
| 11 | 406-0334 | 2 | Clip, Retaining - Turnbutton |
| | | | Fastener |
| 12 | 406-0333 | 2 | Stud, Turnbutton Fastener |
| 13 | 517-0131 | 1 | Plug, Plastic |
| 14 | 303-0076 | 1 | Knob, Pointer |
| 15 | 308-0284 | 1 | Switch, Selector |
| 16 | 303-0032 | 1 | Knob |
| 17 | 303-0170 | 1 | Rheostat (35K Ohms, 25 Watt) |
| 18 | 301-3244 | 1 | Bracket, Mounting, Relay - |
| | | | Code 15, 515 |
| 19 | 870-0053 | 1 | Nut, Hex (#10-32) |
| 20 | 850-0030 | 1 | Washer, Lock - Spring (#10) |
| 21 | 332-0051 | 1 | Clamp, Loop |
| 22 | HARNESS, WIRING - GENERATOR CONTROL | | |
| | Sets Without Meter Panel | | |
| | 338-0765 | 1 | Code 3 |
| | 338-0764 | 1 | Code 15, 515 |
| | 0766 | 1 | Code 6D, 7, 9X |
| | Sets With Meter Panel | | |
| | 338-0735 | 1 | Code 3 |
| | 338-0730 | 1 | Code 15, 515 |
| | 338-0759 | 1 | Code 6D, 7, 9X |
| | ATTACHING HARDWARE FOR WIRING HARNESS | | |
| | 812-0061 | 2 | Screw, Machine - Round Head |
| | | | (#6-32 x 3/8") |
| | 812-0066 | 2 | Screw, Machine - Round Head |
| | | | (#6-32 x 3/4") |
| | 850-0020 | 2 | Washer, Lock - Spring (#6) |
| | 853-0003 | 4 | Washer, Lock - ET (#6) |
| | 853-0006 | 2 | Nut, Hex (#6-32) |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--|-----------|----------------------------------|
| 23 | BLOCK, TERMINAL (Select as Required) | | |
| | 332-0607 | 1 | 12 Place |
| | 332-0795 | 1 | 16 Place |
| 24 | 350-0556 | 1 | Resistor, Fixed, Composition |
| | | | (47K Ohms, 1/2 Watt) - |
| | | | Code 15, 515 |
| 25 | 323-0765 | 1 | Socket, Relay - 11 Place - |
| | | | Code 15, 515 |
| 26 | STRIP, MARKER (Select as Required) | | |
| | 332-1242 | 1 | 16 Place |
| | 332-1248 | 1 | 12 Place |
| 27 | 812-0065 | 4 | Screw, Machine - Round Head |
| | | | (#6-32 x 5/8") |
| 28 | 853-0003 | 4 | Washer, Lock - ET (#6) |
| 29 | REGULATOR, VOLTAGE (Select as Required) | | |
| | NOTE: REGULATOR MATCHED TO VOLTAGE | | |
| | TRANSFORMER, Item #31. (See Separate Parts Catalog | | |
| | #900-0234 for Components) | | |
| | 332-1268 | 1 | Used with 120 VAC Input Signal |
| | 332-1956 | 1 | Used with 240 VAC Input Signal |
| 30 | 321-0204 | 2 | Fuse, Cartridge (1/4 Amp) - Part |
| | | | of 332-1956 Voltage Regulator |
| 31 | TRANSFORMER, VOLTAGE (Select as Required) | | |
| | NOTE: Transformer Matched to Voltage Regulator, | | |
| | Item #29 | | |
| | 315-0342 | 1 | 120 VAC |
| | 315-0431 | 1 | 240 VAC |
| | ATTACHING PARTS FOR TRANSFORMER | | |
| | 812-0061 | 2 | Screw, Machine - Round Head |
| | | | (#6-32 x 3/8") |
| | 853-0003 | 2 | Washer, Lock - ET (#6) |
| 32 | 305-0675 | 1 | Rectifier, Bridge |
| | ATTACHING PARTS FOR RECTIFIER | | |
| | 812-0070 | 2 | Screw, Machine - Round Head |
| | | | (#6-32 x 1-1/4") |
| | 850-0020 | 2 | Washer Lock - Spring (#6) |
| 33 | 315-0384 | 1 | Reactor |
| | ATTACHING PARTS FOR REACTOR | | |
| | 812-0061 | 2 | Screw, Machine - Round Head |
| | | | (#6-32 x 3/8") |
| | 853-0003 | 2 | Washer, Lock - ET (#6) |
| 34 | 406-0332 | 2 | Receptacle, Turnbutton Fastener |
| 35 | 508-0001 | 4 | Grommet, Rubber |
| 36 | 800-0045 | 4 | Screw, Cap - Hex Head |
| | | | (5/16-18 x 3/8") |
| 37 | 850-0045 | 4 | Washer, Lock - Spring (5/16") |
| 38 | 402-0070 | 4 | Dampener, Vibration |
| 39 | 815-0026 | 3 | Screw, Machine - Truss Head |
| | | | (#10-32 x 3/8") |
| 40 | PANEL CONTROL | | |
| | Sets Without Meter Panel | | |
| | 301-3822 | 1 | Code 3 |
| | 301-3821 | 1 | Code 6D, 7, 9X |
| | 301-3274 | 1 | Code 15, 515 |
| | Sets With Meter Panel | | |
| | 301-3169 | 1 | Code 3 |
| | 301-3342 | 1 | Code 6D, 7, 9X |
| | 301-3170 | 1 | Code 15, 515 |
| 41 | 337-0049 | 1 | Strap, Ground |
| | ATTACHING PARTS FOR STRAP | | |
| | 800-0045 | 1 | Screw, Cap - Hex Head |
| | | | (5/16-18 x 3/8") |
| | 850-0045 | 1 | Washer, Lock - Spring (5/16") |
| | 856-0008 | 2 | Washer, Lock - EIT (5/16") |
| | 862-0015 | 1 | Nut, Hex (5/16-18) |
| 42 | 301-3158 | 1 | Box, Control |
| 43 | 821-0010 | 2 | Screw, Self-locking - Hex |
| | | | Washer Head (1/4-20 x 1/2") |
| 44 | CURRENT TRANSFORMER ASSEMBLY (See Separate | | |
| | Figure For Parts) - NOTE: Assembly | | |
| | is Located Behind the Control Box. | | |

GENERATOR CONTROL (WITH SWITCHING REGULATOR)



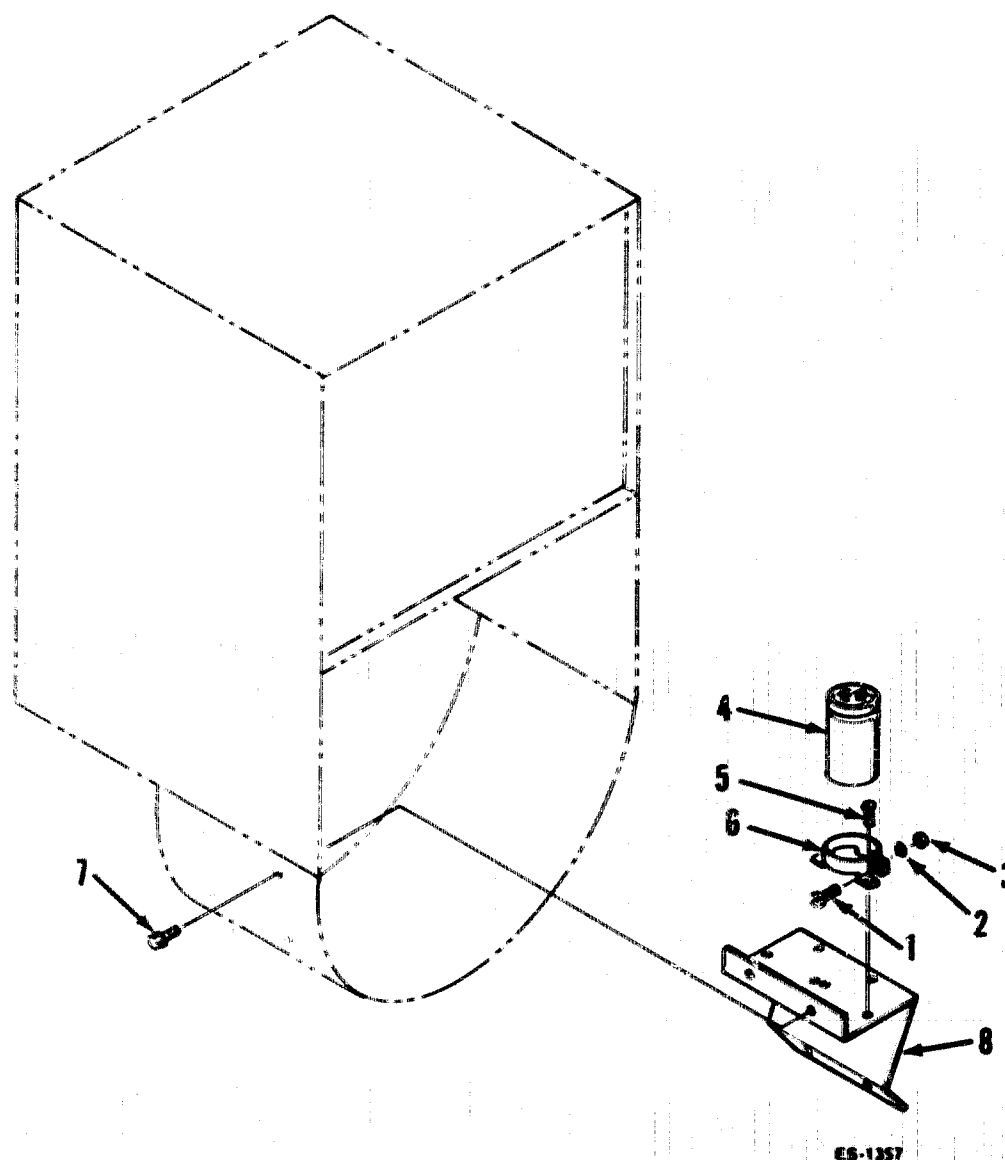
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|------------------------------|-----------|--|
| 1 | 307-1157 | 1 | Spring, Holddown, Relay - Code 15, 515 |
| 2 | 307-1061 | 1 | Relay Code 15, 515 |
| 3 | AMMETER (Select as Required) | | |
| | | | SINGLE SCALE |
| | 302-0406 | 1 | 0-50 Amp |
| | 302-0408 | 1 | 0-75 Amp |
| | 302-0410 | 1 | 0-100 Amp |
| | 302-0411 | 1 | 0-200 Amp |
| | 302-0412 | 1 | 0-250 Amp |
| | 302-0413 | 1 | 0-300 Amp |
| | 302-0605 | 1 | 0-400 Amp |
| | | | DUAL SCALE |
| | 302-0719 | 1 | 0-75, 0-150 Amp |
| | 302-0720 | 1 | 0-100, 0-200 Amp |
| | 302-0721 | 1 | 0-150, 0-300 Amp |
| | 302-0722 | 1 | 0-200, 0-400 Amp |
| | 302-0723 | 1 | 0-250, 0-500 Amp |
| | 302-0724 | 1 | 0-375, 0-750 Amp |

GENERATOR CONTROL (WITH SWITCHING REGULATOR)

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|---|-----------|--|----------|--|-----------|--|
| 4 | VOLTMETER (Select as Required) | | | 23 | BLOCK, TERMINAL (Select as Required) | | |
| | | | SINGLE SCALE | | 332-0607 | 1 | 12 Place |
| | 302-0421 | 1 | 0-300 Volt | | 332-0795 | 1 | 16 Place |
| | 302-0422 | 1 | 0-600 Volt | 24 | 350-0556 | 1 | Resistor, Fixed, Composition (47K Ohms, 1/2 Watt) - Code 15, 515 |
| | 302-0612 | 1 | 0-500 Volt | | | | |
| | 302-0779 | 1 | 0-750 Volt | 25 | 323-0765 | 1 | Socket, Relay - 11 Place - Code 15, 515 |
| | | | DUAL SCALE | | | | |
| | 302-0718 | 1 | 0-300, 0-600 Volt | 26 | STRIP, MARKER (Select as Required) | | |
| 5 | METER, FREQUENCY (Select as Required) | | | | 332-1242 | 1 | 16 Place |
| | | | REED TYPE | | 332-1248 | 1 | 12 Place |
| | 302-0213 | 1 | 115 VAC, 60 Hz | 27 | 812-0065 | 4 | Screw, Machine - Round Head (#6-32 x 5/8") |
| | 302-0221 | 1 | 230 VAC, 60 Hz | | | | |
| | 302-0234 | 1 | 115 VAC, 50 Hz | 28 | 853-0003 | 4 | Washer, Lock - ET (#6) |
| | 302-0256 | 1 | 230 VAC, 50 Hz | 29 | REGULATOR, VOLTAGE (Requires 240 VAC Input Signal) | | |
| | | | POINTER TYPE | | 300-1928 | 1 | Semi-Frequency Sensitive Type |
| | 302-0809 | 1 | 120 VAC, 60 Hz | | 300-1929 | 1 | Voltage Sensitive Type |
| | 302-0810 | 1 | 208 VAC, 60 Hz | | 300-1930 | 1 | Frequency Sensitive Type |
| | 302-0811 | 1 | 240 VAC, 60 Hz | 31 | 315-0431 | 1 | Transformer, Voltage (240 VAC Output Signal) |
| 6 | METER, TIME TOTALIZING (Select as Required) | | | | ATTACHING PARTS FOR TRANSFORMER | | |
| | 302-0466 | 1 | 60 Hz | | 812-0061 | 2 | Screw, Machine - Round Head (#6-32 x 3/8") |
| | 302-0469 | 1 | 50 Hz | | | | |
| 7 | LIGHT, INDICATOR - 125 VAC (Lens Color & Legend Listed Below) | | | | 853-0003 | 2 | Washer, Lock - ET (#6) |
| | 322-0130 | 1 | Red - Lower Scale | 32 | 315-0343 | 1 | Reactor |
| | 322-0131 | 1 | Red - Upper Scale | | ATTACHING PARTS FOR REACTOR | | |
| | 322-0178 | 1 | Light, Indicator - 125 VAC (Amber Lens - No Legend) | | 812-0061 | 2 | Screw, Machine - Round Head (#6-32 x 3/8") |
| 8 | 320-0202 | 1 | Tie Bar - Circuit Breaker | | 853-0003 | 2 | Washer, Lock - ET (#6) |
| 9 | 320-0307 | 1 | Lock, Handle - Circuit Breaker (Used On Penn State Sets) | 33 | 315-0343 | 1 | Reactor |
| 10 | 320-0455 | 2 | Circuit Breaker - 3 Amp, 240 Volt | | ATTACHING PARTS FOR REACTOR | | |
| | ATTACHING HARDWARE FOR CIRCUIT BREAKER | | | | 812-0061 | 2 | Screw, Machine - Round Head (#6-32 x 3/8") |
| | 812-0061 | 4 | Screw, Machine - Round Head (#6-32 x 3/8") | | 853-0003 | 2 | Washer, Lock - ET (#6) |
| | 850-0020 | 4 | Washer, Lock - Spring (#6) | 34 | 406-0332 | 2 | Receptacle, Turnbutton Fastener |
| | 815-0203 | 2 | Screw, Machine - Round Head, Brass (#10-32 x 7/8") | 35 | 508-0001 | 4 | Grommet, Rubber |
| | 871-0010 | 2 | Nut, Hex - Brass (#10-32) | 36 | 800-0045 | 4 | Screw, Cap - Hex Head (5/16-18 x 3/8") |
| | 853-0008 | 2 | Washer, Lock - ET (#10) | 37 | 850-0045 | 4 | Washer, Lock - Spring (5/16") |
| | 526-0049 | 2 | Washer, Flat - Brass (13/64" ID x 7/16" OD x 1/32" Thk) | 38 | 402-0070 | 4 | Dampener, Vibration |
| 11 | 406-0334 | 2 | Clip, Retaining - Turnbutton Fastener | 39 | 815-0026 | 3 | Screw, Machine - Truss Head (#10-32 x 3/8") |
| 12 | 406-0333 | 2 | Stud, Turnbutton Fastener | 40 | PANEL CONTROL | | |
| 13 | 517-0131 | 1 | Plug, Plastic | | 301-3822 | 1 | Sets Without Meter Panel Code 3 |
| 14 | 303-0076 | 1 | Knob, Pointer | | 301-3821 | 1 | Code 6D, 7, 9X |
| 15 | 308-0284 | 1 | Switch, Selector | | 301-7078 | 1 | Code 15, 515 |
| 16 | 303-0032 | 1 | Knob | | | | Sets With Meter Panel |
| 17 | 303-0170 | 1 | Rheostat (35K Ohms, 25 Watt) | | 301-3169 | 1 | Code 3 |
| 18 | 301-3244 | 1 | Bracket, Mounting, Relay - Code 15, 515 | | 301-3342 | 1 | Code 6D, 7, 9X |
| 19 | 870-0053 | 1 | Nut, Hex (#10-32) | | 301-6298 | 1 | Code 15, 515 |
| 20 | 850-0030 | 1 | Washer, Lock - Spring (#10) | 41 | 337-0049 | 1 | Strap, Ground |
| 21 | 332-0051 | 1 | Clamp, Loop | | ATTACHING PARTS FOR STRAP | | |
| 22 | HARNESS, WIRING - GENERATOR CONTROL | | | | 800-0045 | 1 | Screw, Cap - Hex Head (5/16-18 x 3/8") |
| | | | Sets Without Meter Panel | | 850-0045 | 1 | Washer, Lock - Spring (5/16") |
| | 338-0765 | 1 | Code 3 | | 856-0008 | 2 | Washer, Lock - EIT (5/16") |
| | 338-0764 | 1 | Code 15, 515 | | 862-0015 | 1 | Nut, Hex (5/16-18) |
| | 338-0766 | 1 | Code 6D, 7, 9X | 42 | 301-3158 | 1 | Box, Control |
| | | | Sets With Meter Panel | 43 | 821-0010 | 2 | Screw, Self-locking - Hex Washer Head (1/4-20 x 1/2") |
| | 338-0735 | 1 | Code 3 | 44 | CURRENT TRANSFORMER ASSEMBLY (See Separate Figure For Parts) - NOTE: Assembly is Located Behind the Control Box. | | |
| | 338-1469 | 1 | Code 15, 515 | | | | |
| | 338-0759 | 1 | Code 6D, 7, 9X | | | | |
| | ATTACHING HARDWARE FOR WIRING HARNESS | | | | | | |
| | 812-0061 | 2 | Screw, Machine - Round Head (#6-32 x 3/8") | | | | |
| | 812-0066 | 2 | Screw, Machine - Round Head (#6-32 x 3/4") | | | | |
| | 850-0020 | 2 | Washer, Lock - Spring (#6) | | | | |
| | 853-0003 | 4 | Washer, Lock - ET (#6) | | | | |
| | 853-0006 | 2 | Nut, Hex (#6-32) | | | | |

* - NOTE: For lamp replacement order 322-0178. Remove and discard plain red lens, install lens with legend from burned out light -- lights snap in and out of panel.

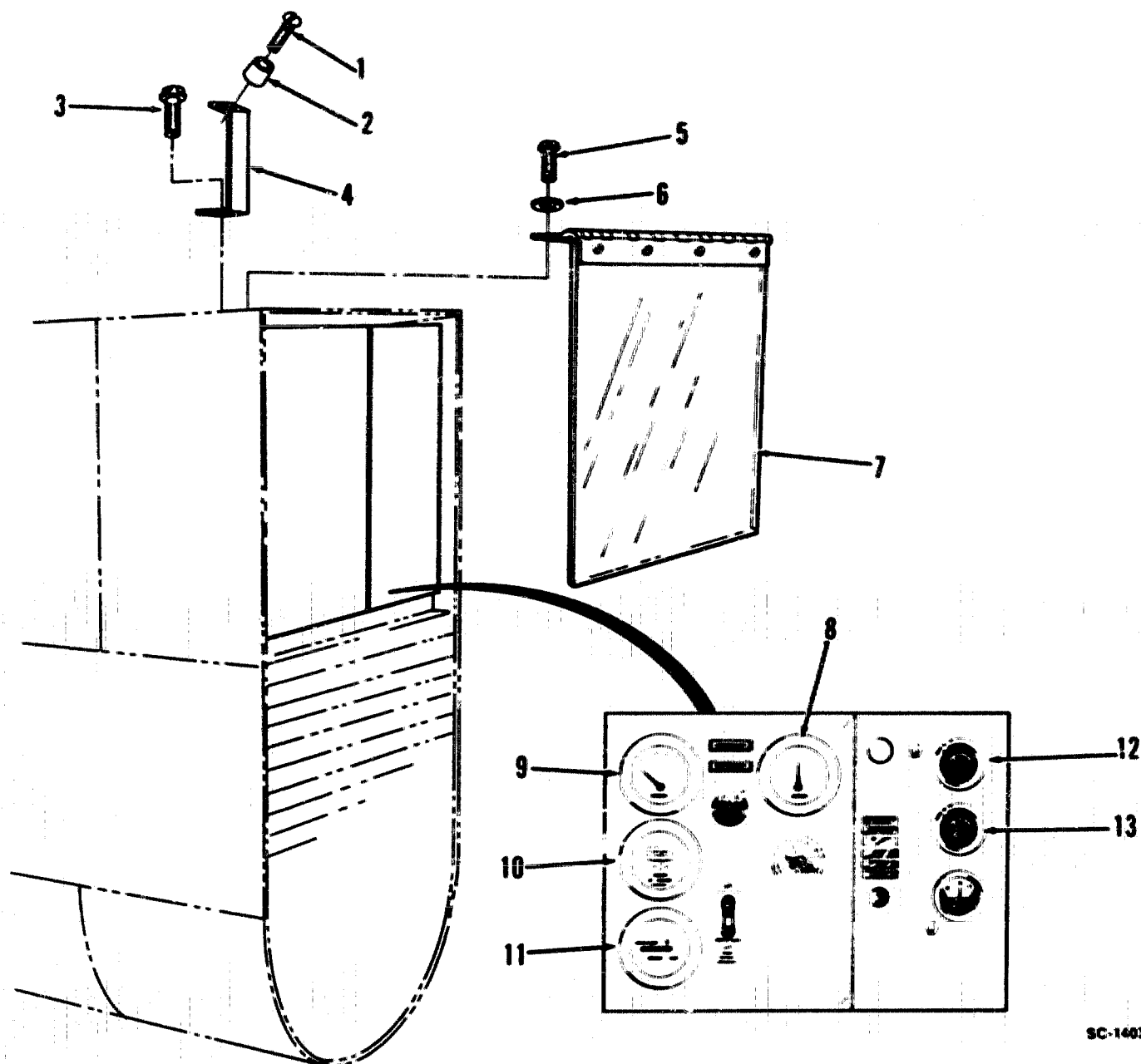
CAPACITOR ASSEMBLY USED WITH SWITCHING VOLTAGE REGULATOR



ES-1357

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|-------------|-------------|--------------|--|
| 1 | 812-0078 | 2 | Screw, Machine - Round Head (#8-32 x 7/16") |
| 2 | 850-0025 | 2 | Washer, Lock - Spring (#8) |
| 3 | 861-0007 | 2 | Nut, Square (#8-32) |
| 4 | 356-0090 | 2 | Capacitor Fixed, Electrolytic (1300 MFD) |
| 5 | 812-0078 | 6 | Screw, Machine - Round Head (#8-32 x 7/16") |
| 6 | 356-0102 | 2 | Clamp, Capacitor Mounting |
| 7 | 821-0009 | 4 | Screw, Self-Locking - Hex Washer Head (1/4-20 x 3/8") |
| 8 | 356-0104 | 1 | Bracket, Mounting - Capacitor |

CONTROL - ENGINE/GENERATOR RUGGEDIZED WITH PROTECTING SHIELD



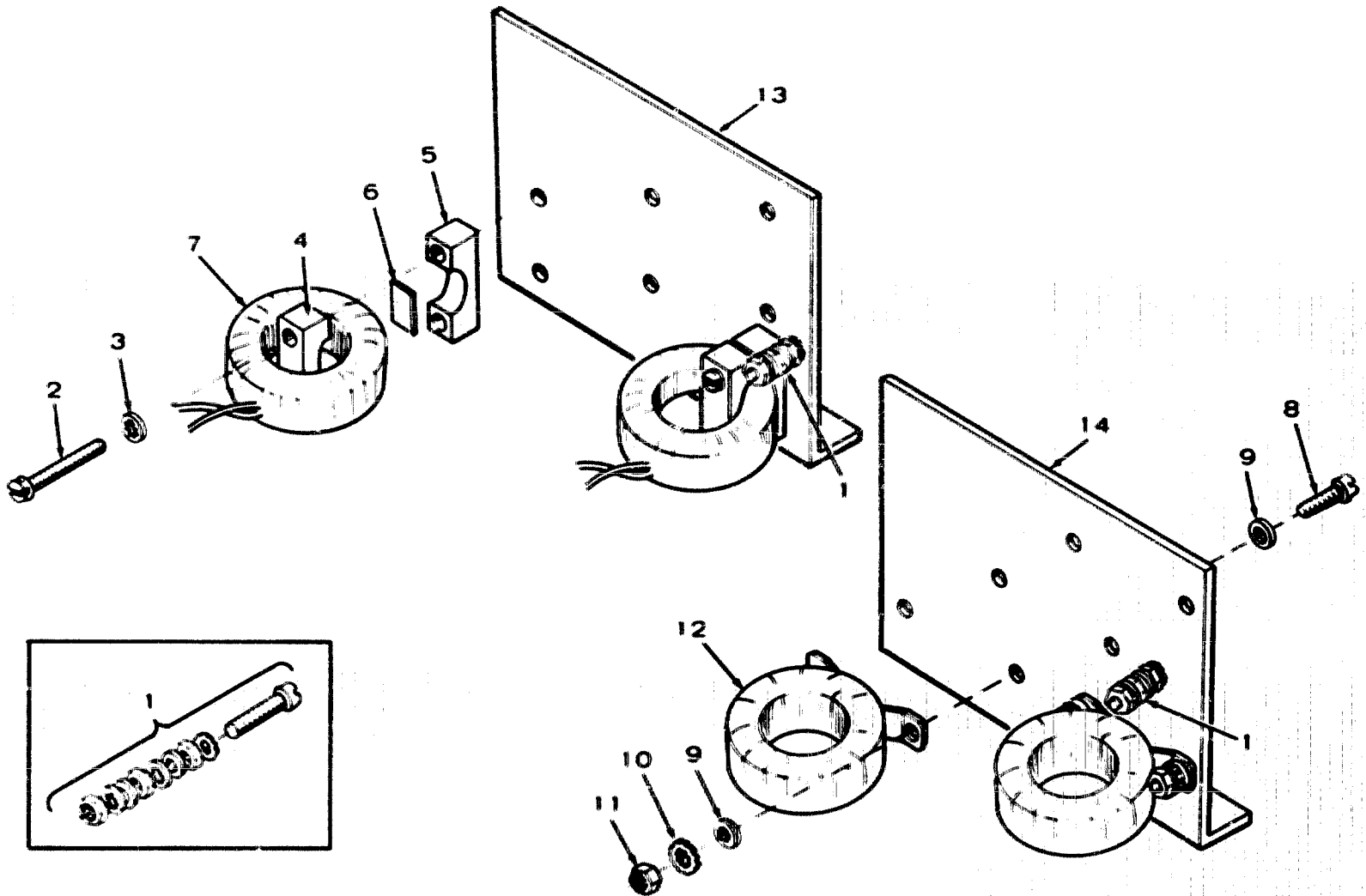
SC-1403

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|---|-----------|--|
| 1 | 812-0063 | 2 | Screw, Machine - Round Head (#6-32 x 1/2") |
| 2 | 402-0029 | 2 | Bumper, Rubber |
| 3 | 821-0014 | 2 | Screw, Self-locking - Hex Washer Head (5/16-18 x 1/2") |
| 4 | 301-3482 | 2 | Bracket |
| 5 | 813-0098 | 5 | Screw, Machine - Round Head (#10-32 x 3/8") |
| 6 | 854-0010 | 5 | Washer, Lock - Internal Tooth (#10) |
| 7 | 301-3486 | 1 | Cover, Protective |
| 8 | ENGINE/GENERATOR CONTROL - RUGGEDIZED | | |
| | AMMETER - DUAL SCALE (Select as Required) | | |
| | 302-0833 | 1 | 0-75, 0-150 AMPS |
| | 302-0834 | 1 | 0-100, 0-200 AMPS |
| | 302-0835 | 1 | 0-150, 0-300 AMPS |
| | 302-0837 | 1 | 0-250, 0-500 AMPS |
| | 302-0838 | 1 | 0-375, 0-750 AMPS |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|---|-----------|---|
| 9 | 302-0839 | 1 | Voltmeter - Dual Scale (0-300, 0-600 VOLTS) |
| 10 | METER, FREQUENCY - REED TYPE (Select as Required) | | |
| | 302-0840 | 1 | 60 Hz |
| | 302-0841 | 1 | 50 Hz |
| 11 | METER, TIME TOTALIZING (Select as Required) | | |
| | 302-0817 | 1 | 60 Hz |
| | 302-0816 | 1 | 50 Hz |
| | ENGINE CONTROL - RUGGEDIZED | | |
| 12 | 193-0212 | 1 | Gauge - Oil Pressure |
| 13 | 193-0213 | 1 | Gauge - Water Temperature |

£ - For Standard components, refer to applicable illustrations and parts lists.

CURRENT TRANSFORMER ASSEMBLY

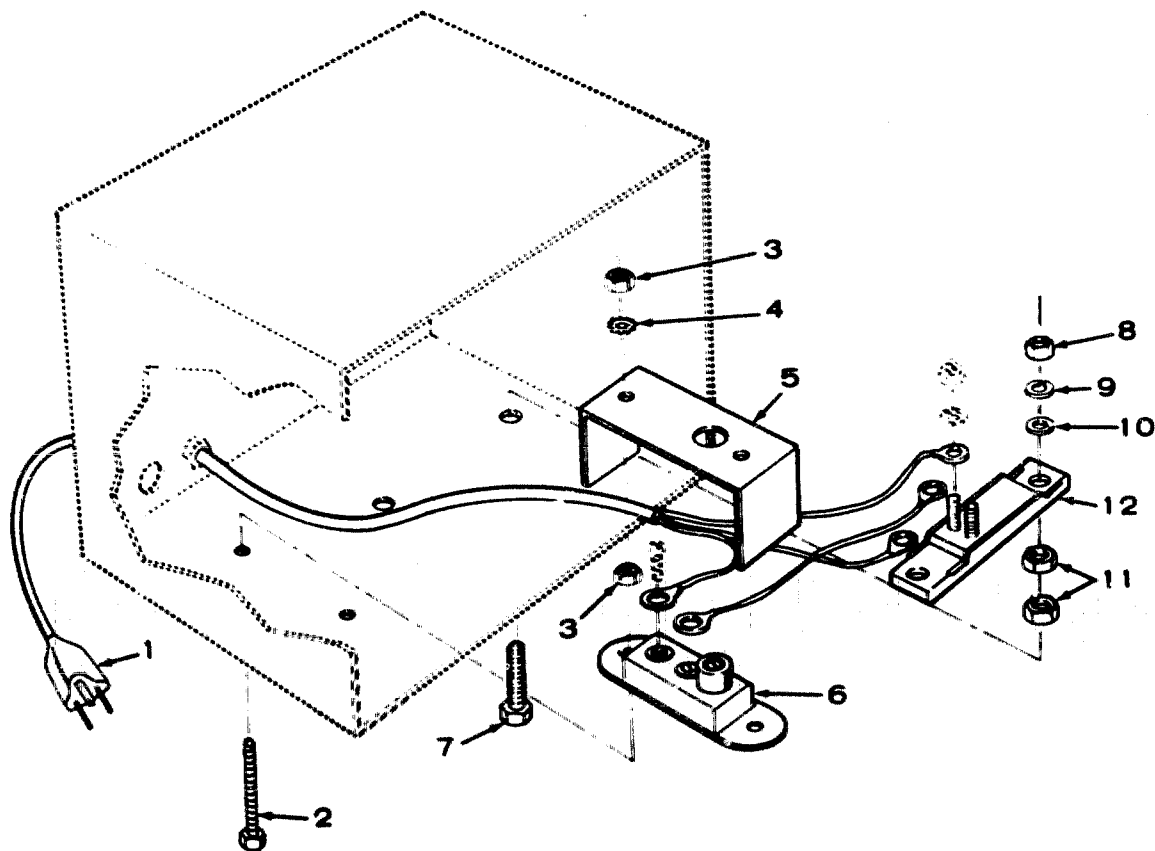


SC-1156

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|---|--|-----------|---|
| CURRENT TRANSFORMER ASSEMBLY (Select Components as Required) | | | |
| 1 | GROUND TERMINAL ASSEMBLY (Includes Following Items) | | |
| | 815-0203 | 1 | Screw, Machine - Round Head, Brass (#10-32 x 7/8") |
| | 871-0010 | 3 | Nut, Hex - Brass (#10-32) |
| | 856-0003 | 1 | Washer, Lock - EIT (#10) |
| | 854-0010 | 2 | Washer, Lock - IT (#10) |
| | 526-0049 | 2 | Washer, Flat - Brass (13/64" ID x 7/32" OD x 1/32" Thk) |
| 2 | 813-0110 | 6 | Screw, Machine - Round Head (#10-32 x 2) |
| 3 | 854-0010 | 6 | Washer, Lock - IT (#10) |
| 4 | 302-0235 | 3 | Clamp, Upper |
| 5 | 302-0236 | 3 | Clamp, Lower |
| 6 | 302-0253 | 6 | Shim |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--|-----------|---|
| 7 | CURRENT TRANSFORMER (Select Size as Required) | | |
| | 302-0117 | 3 | Ratio 50/5, 3 VA |
| | 302-0076 | 3 | Ratio 75/5, 2 VA |
| | 302-0078 | 3 | Ratio 100/5, 2 VA |
| | 302-0079 | 3 | Ratio 150/5, 1 VA |
| | 302-0106 | 3 | Ratio 200/5, 1 VA |
| | 302-0209 | 3 | Ratio 230/5, 1 VA |
| | 302-0107 | 3 | Ratio 300/5, 1 VA |
| 8 | 813-0100 | 6 | Screw, Machine - Round Head (#10-32 x 1/2") |
| 9 | 526-0008 | 6 | Washer, Flat (13/64" ID x 7/16" OD x 1/32" Thk) |
| 10 | 856-0003 | 6 | Washer, Lock - EIT (#10) |
| 11 | 870-0053 | 6 | Nut, Hex (#10-32) |
| 12 | CURRENT TRANSFORMER (Select Size as Required) | | |
| | 302-0952 | 3 | Ratio 75/5, 2 VA |
| | 302-0864 | 3 | Ratio 150/5, 2 VA |
| | 302-0865 | 3 | Ratio 200/5, 2 VA |
| | 302-0866 | 3 | Ratio 250/5, 2 VA |
| | 302-0608 | 3 | Ratio 400/5, 2 VA |
| | 302-0547 | 3 | Ratio 500/5, 2 VA |
| | 302-0471 | 3 | Ratio 750/5, 2 VA |
| 13 | 302-0729 | 1 | Bracket, Mounting - Transformer |
| 14 | 302-0764 | 1 | Bracket, Mounting - Transformer |

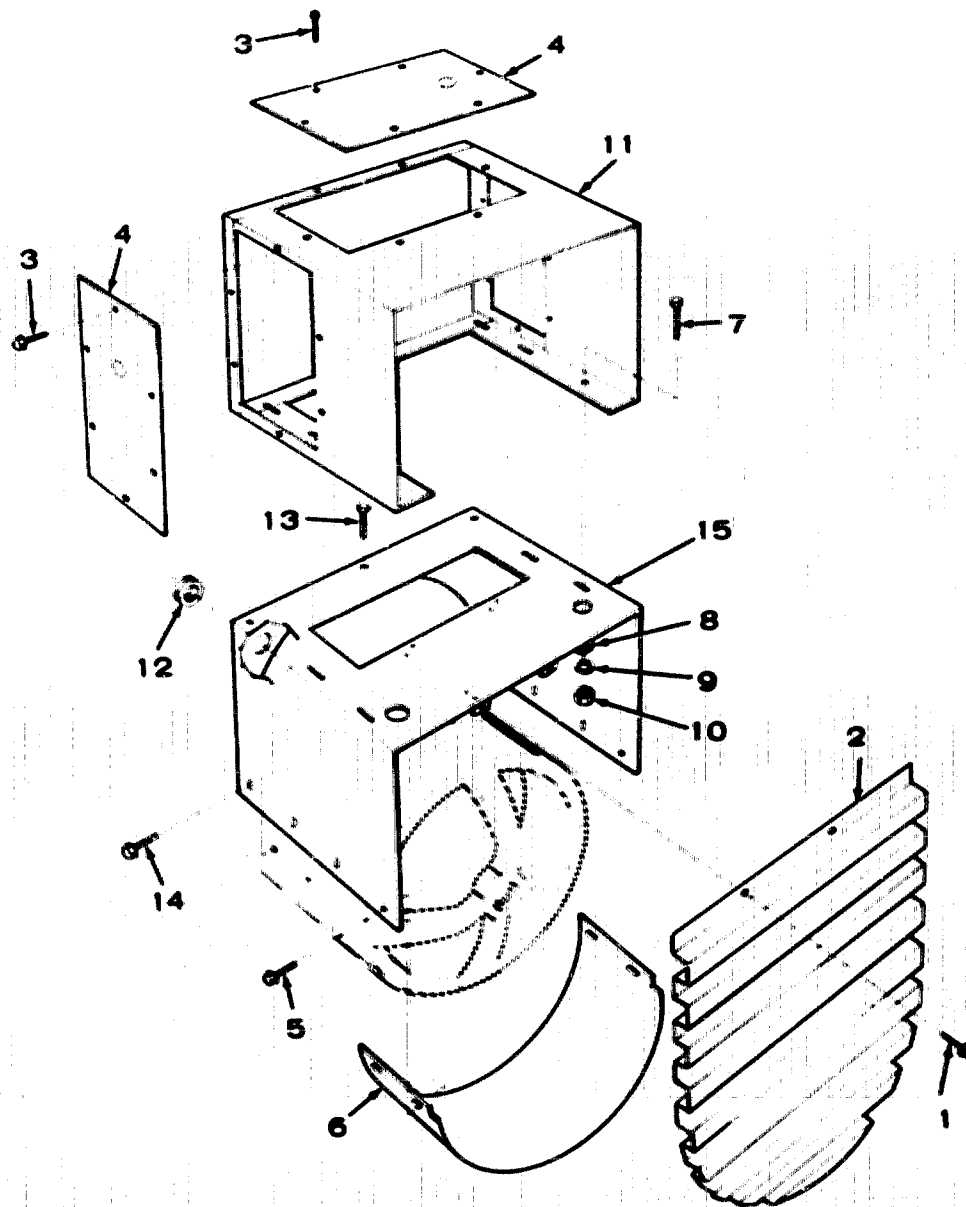
CONTROL HEATER



SC-1158

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|-------------|-------------|--------------|--|
| 1 | 335-0110 | 1 | Cable, Electrical (3 Wire) |
| 2 | 812-0090 | 2 | Screw, Machine - Round Head (#6-32 x 2-1/4") |
| 3 | 860-0006 | 4 | Nut, Hex (#6-32) |
| 4 | 856-0001 | 2 | Washer, Lock - EIT (#6) |
| 5 | 301-1886 | 1 | Cover, Thermostat |
| 6 | 309-0128 | 1 | Thermostat - Adjustable |
| 7 | 800-0007 | 2 | Screw, Cap - Hex Head (1/4-20 x 1") |
| 8 | 862-0001 | 2 | Nut, Hex (1/4-20) |
| 9 | 850-0040 | 2 | Washer, Lock - Spring (1/4) |
| 10 | 526-0052 | 2 | Washer, Flat (17/64" ID x 9/16" OD x 1/16" Thk) |
| 11 | 862-0015 | 4 | Nut, Hex (5/16-18) - Used As Spacers |
| 12 | 333-0151 | 1 | Heater - 75 Watt, 120 VAC, 300 Watt, 240 VAC |

CONTROL HOUSING

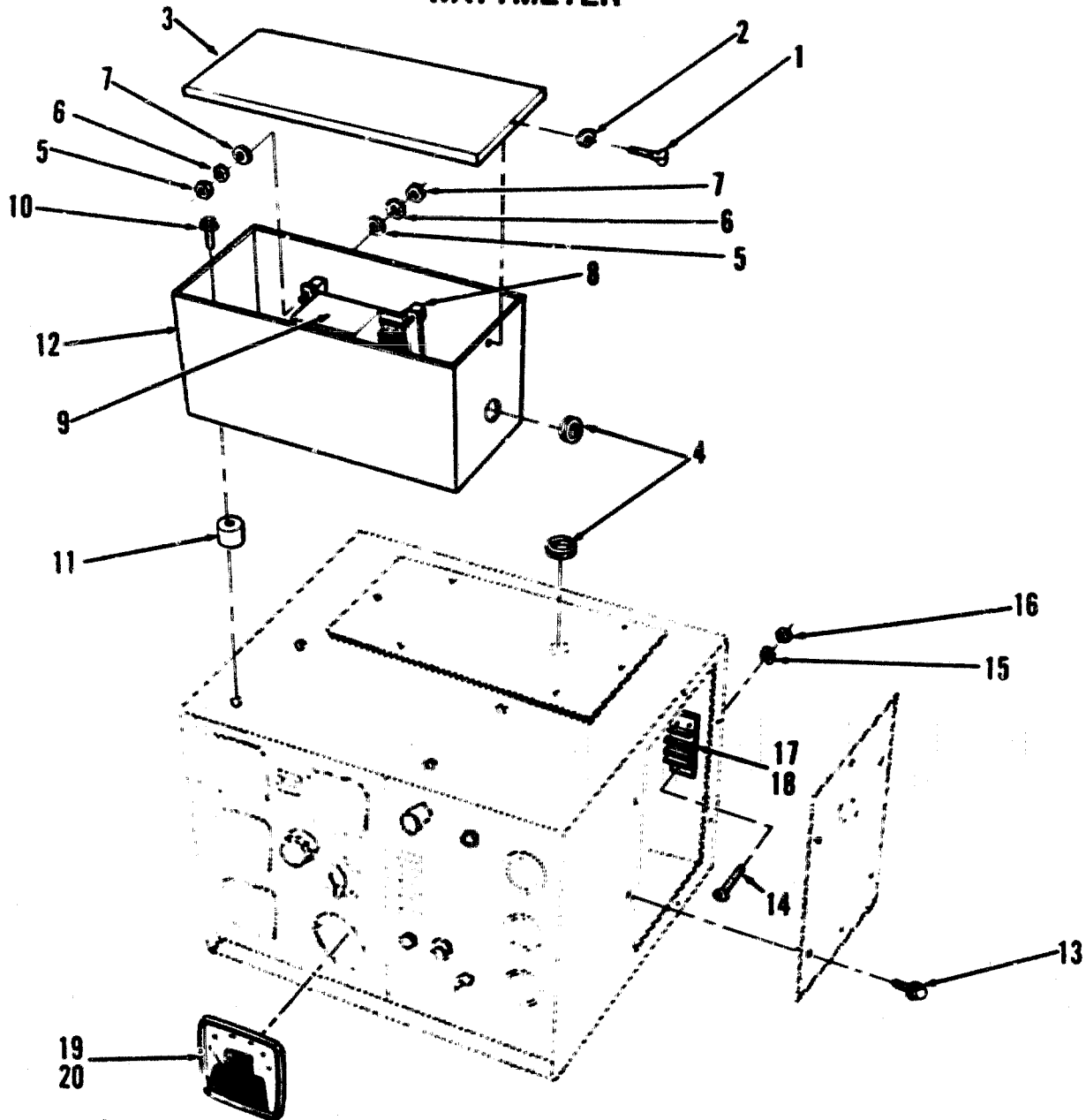


M-1180

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|--|
| 1 | 821-0010 | 8 | Screw Self-locking - Hex Washer Head (1/4-20 x 1/2") |
| 2 | 234-0370 | 1 | Grill, Air - Generator Inlet |
| 3 | 815-0350 | 18 | Screw, Tapping - Hex Washer Head (#10-32 x 3/8") |
| 4 | 301-3156 | 3 | Panel, Access |
| 5 | 821-0010 | 4 | Screw Self-locking - Hex Washer Head (1/4-20 x 1/2") |
| 6 | 234-0361 | 1 | Wrapper, End Bell |
| 7 | 821-0018 | 6 | Screw Self-locking - Hex Washer Head (1/4-20 x 5/8") |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|---|
| 8 | 856-0006 | 1 | Washer, Lock - EIT (1/4") |
| 9 | 526-0018 | 5 | Washer, Flat (17/64" ID x 5/8" OD x 1/16" Thk) |
| 10 | 870-0212 | 6 | Nut, Hex (1/4-20) |
| 11 | 301-3155 | 1 | Housing, Control Box |
| 12 | 508-0203 | 1 | Bushing, Cable - Nylon |
| 13 | 821-0010 | 1 | Screw Self-locking - Hex Washer Head (1/4-20 x 1/2") |
| 14 | 821-0014 | 8 | Screw Self-locking - Hex Washer Head (5/16-18 x 1/2") |
| 15 | 301-3154 | 1 | Saddle, Control Box |

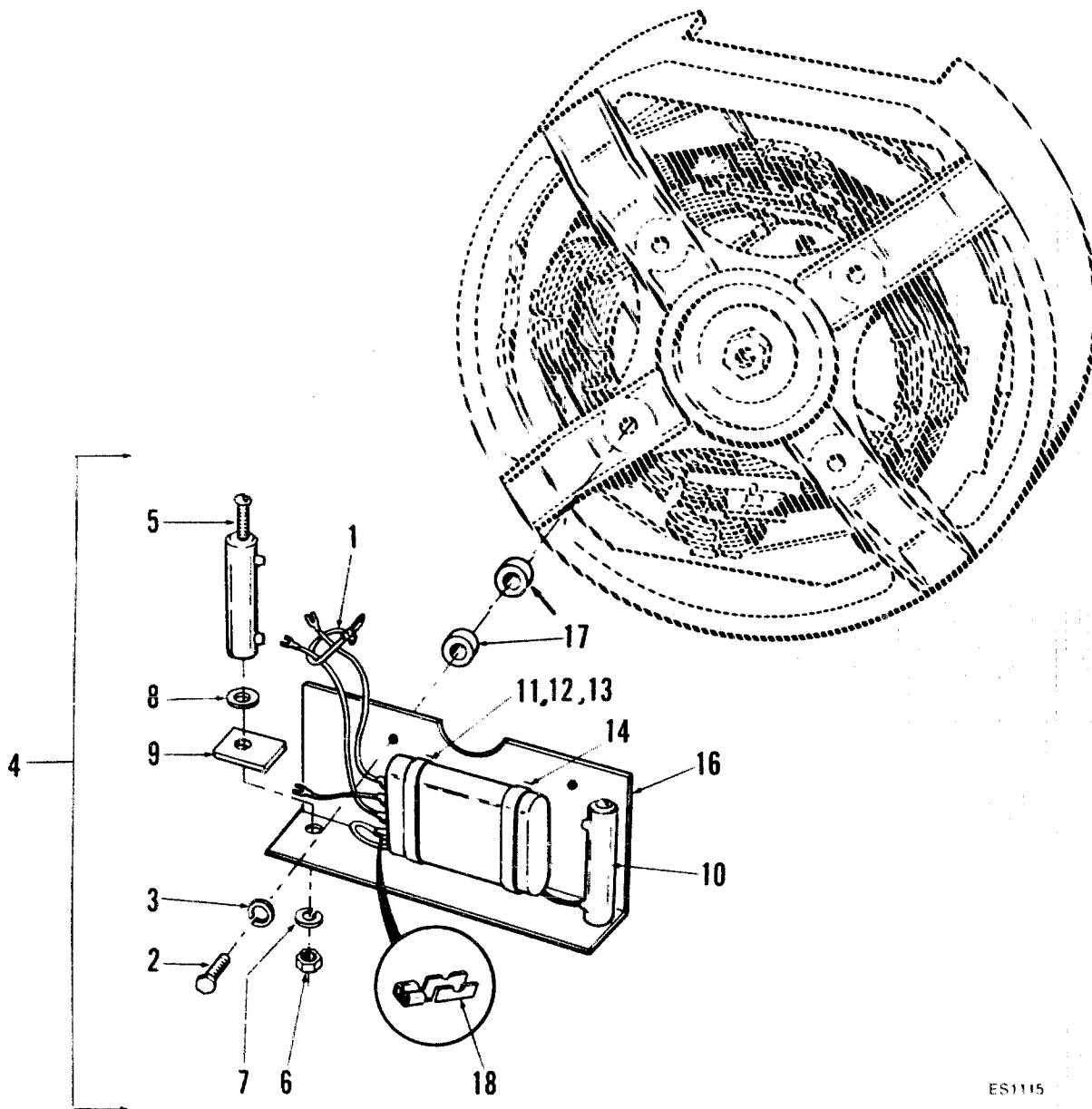
WATTMETER



3C1157

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|---------------------------------|-----------|--|----------|--------------------------------------|-----------|------------------------------------|
| 1 | 815-0026 | 2 | Screw, Machine - Truss Head (#10-32 x 3/8") | 15 | 853-0003 | 4 | Washer, Lock - External Tooth (#8) |
| 2 | 853-0008 | 2 | Washer, Lock - External Tooth (#10) | 16 | 860-0006 | 4 | Nut, Hex (#6-32) |
| 3 | 301-3476 | 1 | Cover - Transducer Box | 17 | 332-0609 | 1 | Terminal, Strip |
| 4 | 508-0001 | 2 | Grommet, Rubber (1-1/6" OD) | 18 | 332-0610 | 1 | Marker, Strip |
| 5 | 860-0008 | 8 | Nut, Hex (#8-32) | 19 | 302-1102 | 1 | Wattmeter (Less Replaceable Dial) |
| 6 | 853-0005 | 8 | Washer, Lock - External Tooth (#8) | 20 | DIAL, WATTMETER (Select as Required) | | |
| 7 | 526-0003 | 8 | Washer, Flat (11/64" ID x 3/8" OD x 1/32" Thk) | 302-1103 | | 1 | Scale 0-35 kW |
| 8 | 402-0354 | 4 | Mount, Vibration | 302-1104 | | 1 | Scale 0-50 kW |
| 9 | TRANSDUCER (Select as Required) | | | 302-1105 | | 1 | Scale 0-70 kW |
| | 302-1082 | 1 | 60 Hertz | 302-1106 | | 1 | Scale 0-90 kW |
| | 302-1083 | 1 | 50 Hertz | 302-1107 | | 1 | Scale 0-115 kW |
| 10 | 821-0014 | 8 | Screw, Self-locking - Hex Washer Head (5/16-18 x 1/2") | 302-1108 | | 1 | Scale 0-160 kW |
| 11 | 402-0070 | 4 | Mount, Vibration | 302-1109 | | 1 | Scale 0-180 kW |
| 12 | 301-3477 | 1 | Box, Transducer | 302-1110 | | 1 | Scale 0-200 kW |
| 13 | 815-0350 | 6 | Screw, Tapping - Hex Washer Head (#10-32 x 3/8") | 302-1115 | | 1 | Scale 0-250 kW |
| 14 | 812-0063 | 4 | Screw, Machine - Round Head (#6-32 x 1/2") | 302-1116 | | 1 | Scale 0-300 kW |
| | | | | 302-1117 | | 1 | Scale 0-350 kW |
| | | | | 302-1118 | | 1 | Scale 0-400 kW |
| | | | | 302-1119 | | 1 | Scale 0-450 kW |
| | | | | 302-1120 | | 1 | Scale 0-550 kW |
| | | | | 302-1121 | | 1 | Scale 0-650 kW |
| | | | | 302-1122 | | 1 | Scale 0-750 kW |

VOLTAGE REGULATOR FILTER



ES1115

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--|-----------|--|----------|--------------------------------|-----------|--|
| | KIT, FILTER - VOLTAGE REGULATOR (Includes Parts Marked *) | | | 7 | 850-0040 | 2 | Washer, Lock - Spring (1/4") |
| | 232-2694 | 1 | Used on Sets with End Bell Mounted Voltage Regulator | 8 | 304-0427 | 4 | Washer, Centering (1/4") |
| | 232-2695 | 1 | Used on Sets with Voltage Regulator Mounted in Control Box | 9 | 304-0292 | 2 | Insulator |
| 1 | 332-0941 | 5 | * Tie, Cable | 10 | 354-0025 | 2 | Resistor, Fixed, Wire Wound (10-Ohm, 100 Watt) |
| 2 | 800-0003 | 2 | * Screw, Cap - Hex Head (1/4-20 x 1/2") | 11 | 813-0098 | 4 | Screw, Machine - Round Head (#10-32 x 3/8") |
| 3 | 850-0040 | 2 | * Washer, Lock - Spring (1/4") | 12 | 870-0053 | 4 | Nut, Hex (#10-32) |
| 4 | * FILTER ASSEMBLY (Includes all Parts Except as Indicated) | | | 13 | 850-0030 | 4 | Washer, Lock - Spring (#10) |
| | 232-2219 | REF | Part of Kit 232-2694 | 14 | 312-0189 | 2 | Bracket, Mounting - Capacitor |
| | 232-2692 | REF | Part of Kit 232-2695 | 15 | 312-0188 | 1 | Capacitor, Fixed - 15 MFD, 440 VAC |
| 5 | 812-0165 | 2 | Screw, Machine - Round Head (1/4-20 x 4-1/2") | 16 | 232-2210 | 1 | Bracket, Mounting |
| 6 | 862-0001 | 2 | Nut, Hex (1/4-20) | 17 | 526-0018 | 15 | Washer, Flat (1/4") |
| | | | | 18 | TERMINALS (Select as Required) | | |
| | | | | | 332-1279 | 8 | Insulated 14-16 AWG |
| | | | | | 332-0529 | 4 | Lug 14-16 AWG |

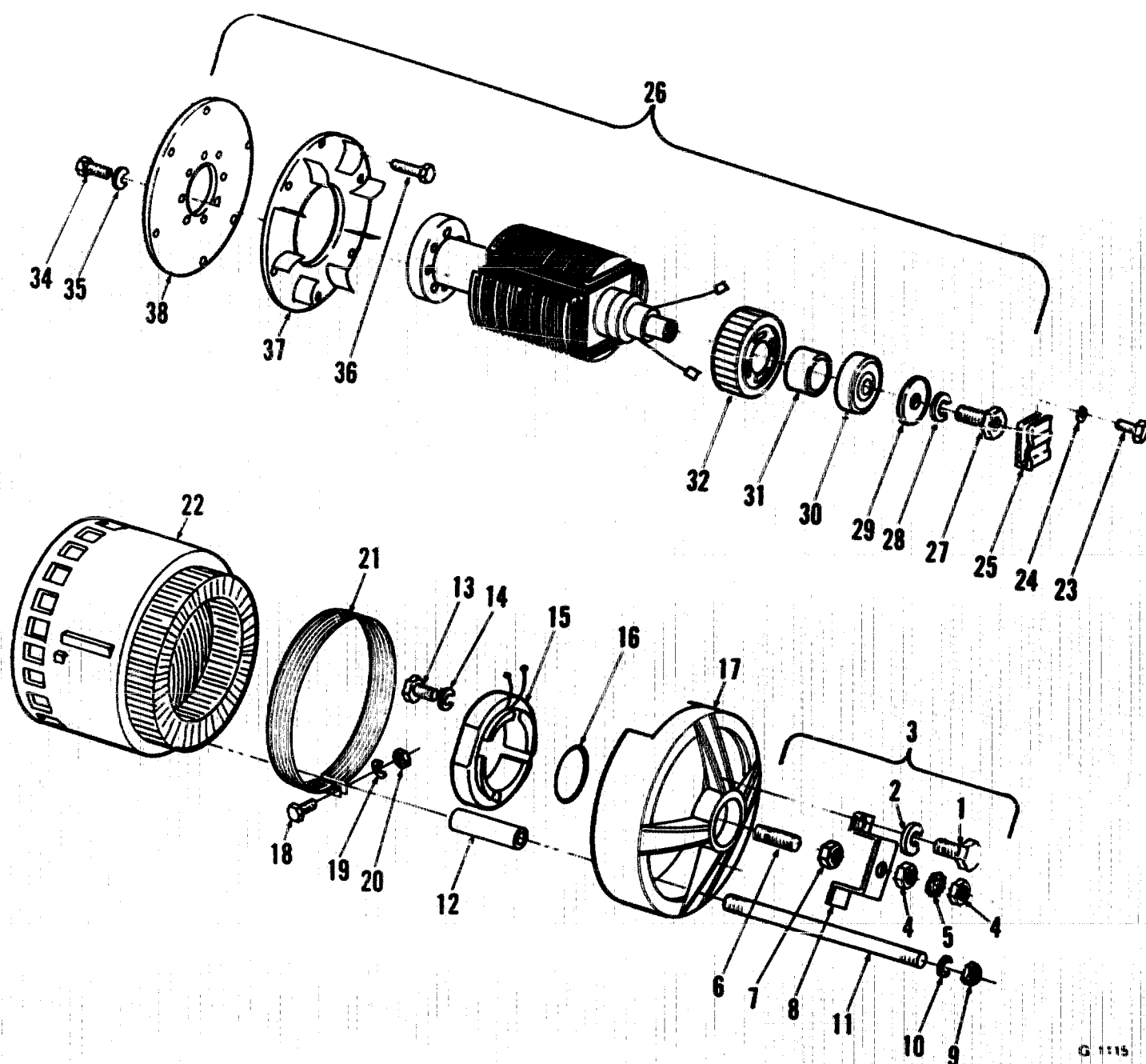
* Parts included in kits

Generator Section

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| Voltage Suppressor Assembly..... | F4 |
| Exciter Rotor..... | F5 |
| Generator Heater..... | F6 |

GENERATOR ASSEMBLY - BRUSHLESS TYPE USED WITH REMOTE VOLTAGE REGULATOR



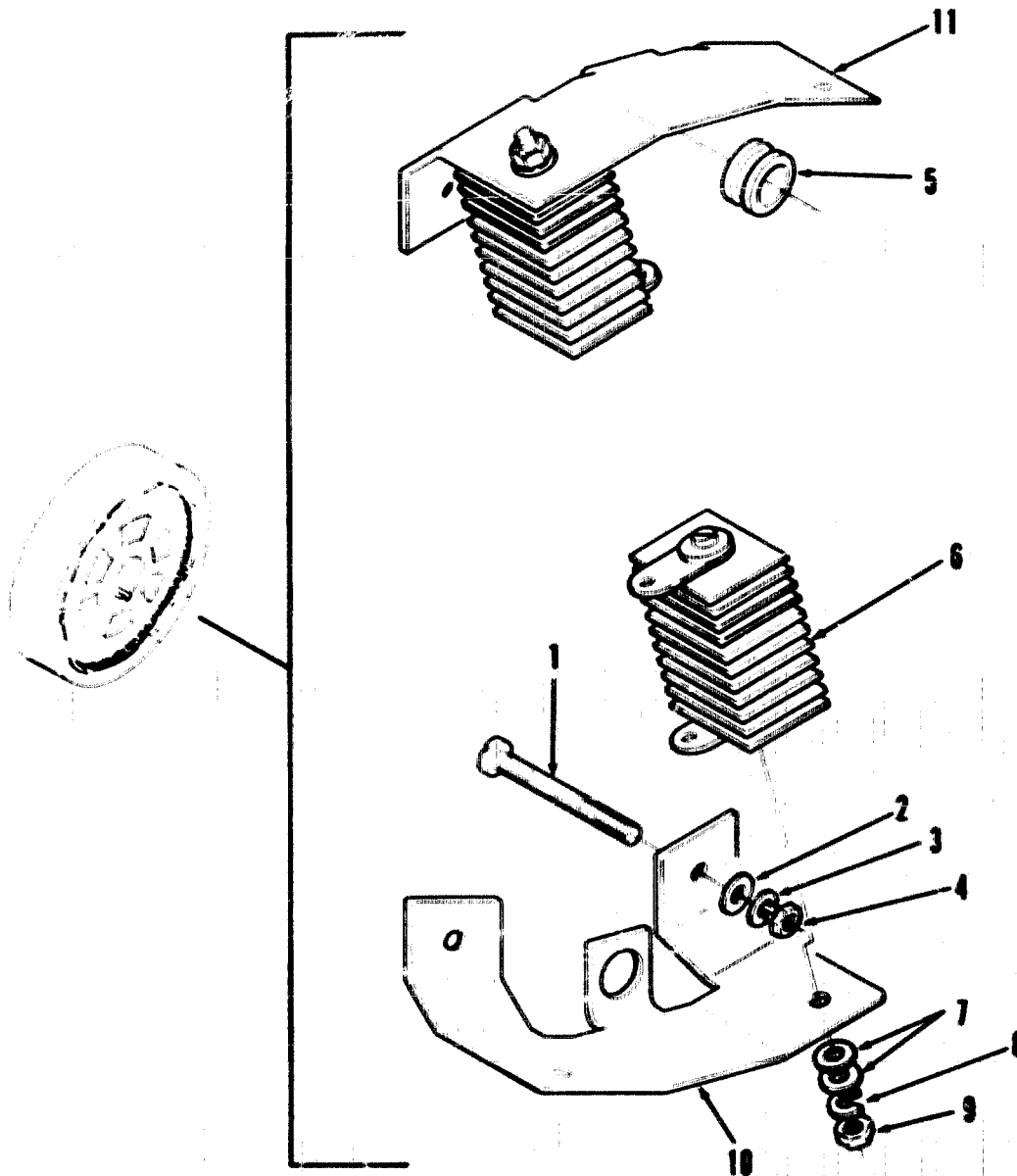
G 1115

GENERATOR ASSEMBLY - BRUSHLESS TYPE USED WITH REMOTE VOLTAGE REGULATOR

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--------------------------------------|-----------|---|----------|--|-----------|--|
| 1 | 800-0003 | 2 | Screw, Cap - Hex Head (1/4-20 x 1/2") | 26 | ROTOR ASSEMBLY, GENERATOR (Includes Parts Marked*) | | |
| 2 | 850-0040 | 2 | Washer, Lock - Spring (1/4") | | | | 50 HERTZ SETS |
| 3 | 150-1456 | 1 | Contact Assembly - Overspeed Switch (Includes Parts Marked -) | 201-2666 | 1 | | Code 515 |
| 4 | 862-0001 | 2 | +Nut, Hex (1/4-20) | 201-2669 | 1 | | Code 515 (Extended Stack) |
| 5 | 853-0013 | 1 | +Washer, Lock - ET (1/4") | | | | 60 HERTZ SETS |
| 6 | 150-0723 | 1 | +Contact, Electrical | 201-2687 | 1 | | Code 3 |
| 7 | 870-0250 | 1 | +Nut, Insulated | | | | Code 3 (Environmental Protected) |
| 8 | 150-1356 | 1 | +Bracket, Mounting - Contact | 201-2666 | 1 | | Codes 6D, 7, 9X, 15 |
| 9 | 862-0011 | 4 | Nut, hex - Grade 8 (3/8-16) | 201-2669 | 1 | | Code 15 (Extended Stack) |
| 10 | 850-0050 | 4 | Washer, Lock - Spring (3/8") | 201-2684 | 1 | | Code 15 (Environmental Protected) |
| 11 | STUD (Select as Required) | | | 201-2687 | 1 | | Code 15 (Extended Stack and Environmental Protected) |
| | 520-0718 | 4 | 3/8-16 UNC x 14-11/16" Lg | 27 | 800-0513 | 1 | *Screw, Cap - Hex Head Modified with 3/8-16 Tapped Center Hole (3/4-10 x 1-1/2") |
| | 520-0721 | 4 | 3/8-16 UNC x 16-11/32" Lg | 28 | 850-0079 | 1 | *Washer, Lock - Spring (3/4") |
| 12 | 503-0611 | 4 | Hose, Rubber | 29 | 526-0238 | 1 | *Washer, Flat - Steel Alloy (13/16" ID x 2" OD x 3/16" Thk) |
| 13 | 800-0009 | 4 | Screw, Cap - Hex Head (1/4-20 x 1-1/2") | 30 | 510-0101 | 1 | *Bearing, Ball |
| 14 | 850-0040 | 4 | Washer, Lock - Spring (1/4") | 31 | 232-2102 | 1 | *Spacer, Sleeve |
| 15 | STATOR, EXCITER (Select as Required) | | | 32 | *ROTOR ASSEMBLY, EXCITER (See Separate Group for Components) | | |
| | 220-2353 | 1 | Standard | | | | 201-1739 1 Standard |
| | 220-1774 | 1 | Environmental Protected | | | | 201-1845 1 Environmental Protected |
| 16 | 509-0125 | 1 | Seal, Oil - "O" Ring | 33 | 515-0145 | 1 | *Key, Machine (1/4" x 1/4" x 7/8") |
| 17 | 211-0185 | 1 | End Bell, Generator | 34 | *BOLT, PLACE - HEX HEAD, GRADE 8 (Select as Required) | | |
| 18 | 800-0008 | 2 | Screw, Cap - Hex Head (1/4-20 x 1-1/4") | | | | 805-0033 8 5/8-11 x 1" |
| 19 | 850-0040 | 2 | Washer, Lock - Spring (1/4") | | | | 805-0035 8 5/8-11 x 1-1/2" |
| 20 | 862-0001 | 2 | Nut, Hex (1/4-20) | 35 | 526-0250 | 8 | *Washer, Flat - Hardened Steel (11/16" ID x 1-3/8" OD x 7/64" Thk) |
| 21 | 234-0368 | 1 | Screen, Air - Generator | 36 | *BOLT, PLACE - HEX HEAD, GRADE 8 (Select as Required) | | |
| 22 | STATOR ASSEMBLY, GENERATOR | | | | | | 805-0018 8 3/8-16 x 1" |
| | | | 50 HERTZ SETS | | | | 805-0019 8 3/8-16 x 1-1/4" |
| | 220-1994 | 1 | Code 515 | 37 | 205-0089 | 1 | *Fan, Generator |
| | 220-1997 | | Code 515 (Extended Stack) | 38 | 232-2078 | 1 | *Disk Drive - Generator |
| | | | 60 HERTZ SETS | | | | |
| | 220-1552 | 1 | Code 3 | | | | |
| | 220-1845 | 1 | Code 3 (Environmental Protected) | | | | |
| | 220-2621 | 1 | Code 6D | | | | |
| | 220-2459 | 1 | Code 7 | | | | |
| | 220-1599 | 1 | Code 9X | | | | |
| | 220-1451 | 1 | Code 15 | | | | |
| | 220-1454 | 1 | Code 15 (Extended Stack) | | | | |
| | 220-1783 | 1 | Code 15 (Environmental Protected) | | | | |
| | 220-1786 | 1 | Code 15 (Extended Stack and Environmental Protected) | | | | |
| 23 | 800-0048 | 1 | Screw, Cap - Hex Head (3/8-16 x 3/4") | | | | |
| 24 | 856-0010 | 1 | Washer, Lock - EIT (3/8") | | | | |
| 25 | 150-0717 | 1 | Switch, Overspeed | | | | |

- - Parts Included in Overspeed Switch Assembly.
- * - Parts Included in Generator Rotor Assembly.
- † - Extended Stack type assemblies that are used on sets having full power output on both single and three phase hookups. Both phases carry same kW and kVA ratings.
- £ - Environmental protected assemblies or parts which are coated with epoxy and are for use in high humidity areas.

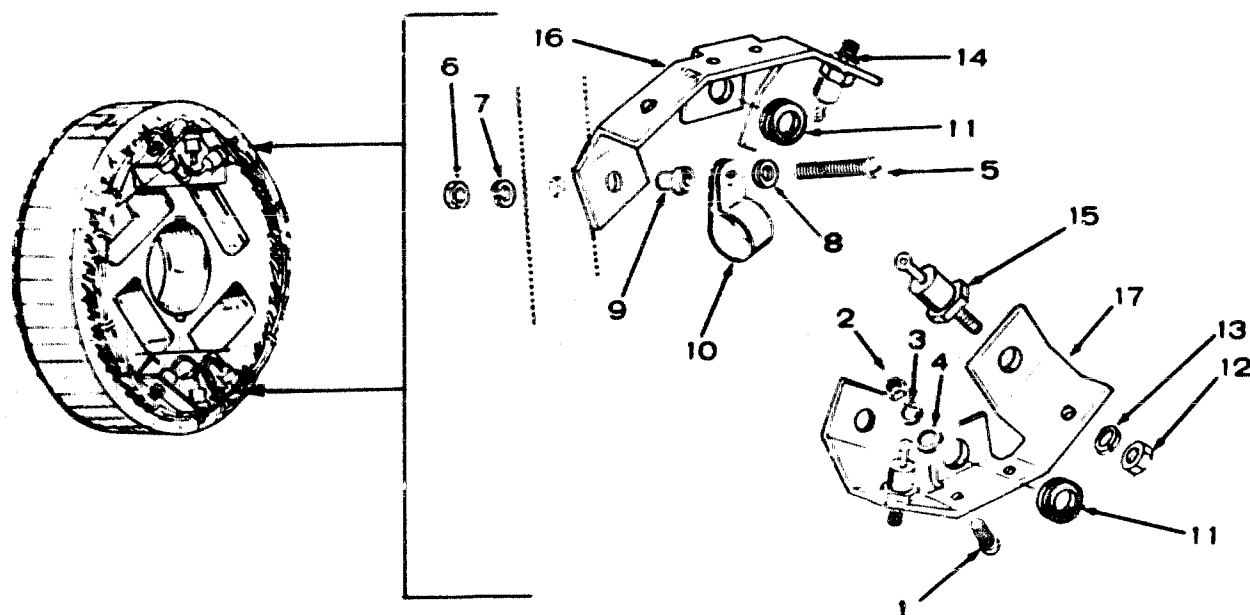
VOLTAGE SUPPRESSOR ASSEMBLY



ES-1285-1

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|----------|-----------|---|----------|----------|-----------|---|
| | 232-2444 | 1 | Voltage Suppressor Assembly (Includes Items 5 thru 11) | 6 | 305-0526 | 1 | Set, Voltage Suppressor (Matched Pair) Includes Items 7 thru 9 |
| | | | ATTACHING PARTS FOR ASSEMBLY | | | | ATTACHING PARTS FOR SUPPRESSORS |
| 1 | 813-0112 | 4 | Screw, Machine - Round Head (#10-32 x 2-1/2") | 7 | 526-0140 | 4 | Washer, Flat (7/32" ID x 3/8" OD x 3/64" Thk) |
| 2 | 526-0140 | 4 | Washer, Flat (7/32" ID x 3/8" OD x 3/64" Thk) | 8 | 850-0030 | 4 | Washer, Lock - Spring (#10) |
| 3 | 850-0030 | 4 | Washer, Lock - Spring (#10) | 9 | 870-0053 | 4 | Nut, Hex (#10-32) |
| 4 | 870-0053 | 4 | Nut, Hex (#10-32) | | | | ----- |
| 5 | 508-0093 | 2 | Grommet, Rubber | 10 | 363-0054 | 1 | Heatsink - Positive |
| | | | | 11 | 363-0055 | 1 | Heatsink - Negative |

EXCITER ROTOR

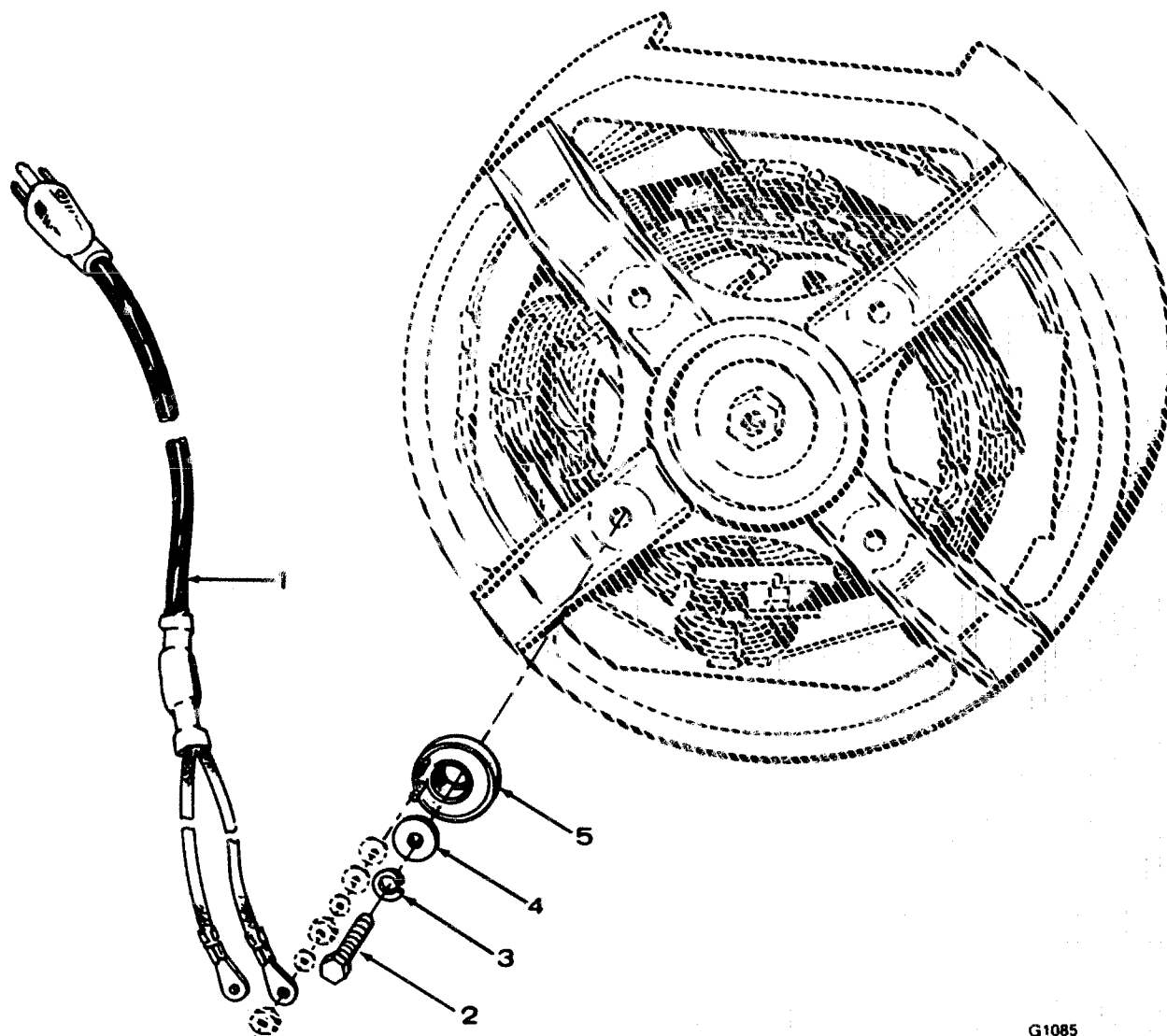


G-1030

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|---|--|-----------|---|
| ROTOR ASSEMBLY, EXCITER (Includes Parts Marked *) | | | |
| | 201-1739 | 1 | Standard |
| | 201-1845 | 1 | Enviromental Protected (Expoxyed) |
| 1 | 813-0100 | 2 | Screw, Machine - Round Head (#10-32 x 1/2") |
| 2 | 870-0053 | 2 | Nut, Hex (#10-32) |
| 3 | 850-0030 | 2 | Washer, Lock - Spring (#10) |
| 4 | 526-0008 | 2 | Washer, Flat (13/64" ID x 7/16" OD x 1/32" Thk) |
| 5 | 813-0110 | 4 | *Screw, Machine - Round Head (#10-32 x 2") |
| 6 | 870-0053 | 4 | *Nut, Hex (#10-32) |
| 7 | 850-0030 | 4 | *Washer, Lock - Spring (#10) |
| 8 | 526-0009 | 4 | *Washer, Flat (7/32" ID x 1/2" OD x 1/16" Thk) |
| 9 | 508-0187 | 4 | *Spacer, Stepped |
| 10 | 332-0050 | 2 | *Clamp, Loop |
| 11 | 508-0093 | 2 | *Grommet, Rubber |
| 12 | 870-0053 | 6 | *Nut, Hex (#10-32) |
| 13 | 850-0030 | 6 | *Washer, Lock - Spring (#10) |
| 14 | *DIODE, RECTIFIER - POSITIVE (CR1, CR2, CR3) | | |
| | 358-0016 | 3 | Standard |
| | 358-0044 | 3 | Enviromental Protected (Expoxyed) |
| 15 | *DIODE, RECTIFIER - NEGATIVE (CR4, CR5, CR6) | | |
| | 358-0015 | 3 | Standard |
| | 358-0043 | 3 | Enviromental Protected (Expoxyed) |
| 16 | 363-0054 | 1 | *Heat, Sink - Positive Diodes |
| 17 | 363-0055 | 1 | *Heat, Sink - Negative Diodes |

* - Parts included in Exciter Rotor Assembly

GENERATOR HEATER



G1085

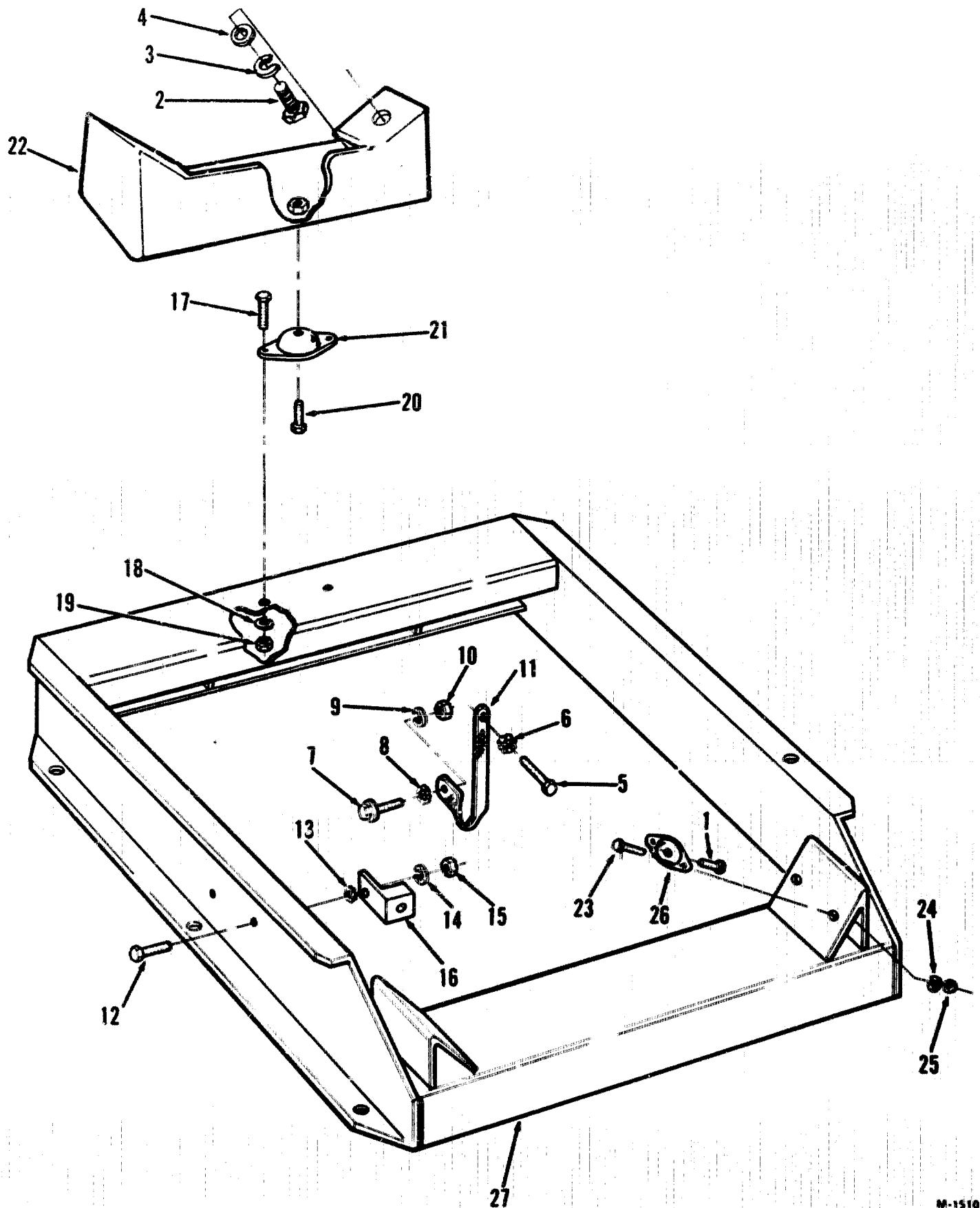
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|-------------------|--------------------------------------|-----------|--|
| HEATER, GENERATOR | | | |
| | | 1 | 120 Volt |
| | | 1 | 240 Volt |
| 1 | CABLE ASSEMBLY (Includes Thermostat) | | |
| | 335-0146 | 1 | 120 Volt |
| | 335-0147 | 1 | 240 Volt |
| 2 | 800-0004 | 1 | Screw, Cap - Hex Head (1/4-20 x 5/8") |
| 3 | 850-0038 | 1 | Washer, Lock - Spring (1/4") |
| 4 | 526-0158 | 1 | Washer, Flat (17/64" ID 1" OD x 1/8" Thk) |
| 5 | HEATER, ELECTRICAL | | |
| | 333-0059 | 1 | 120 Volt, 125 Watt |
| | 333-0192 | 1 | 240 Volt, 200 Watt |

Chassis-Housing Section

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| ILLUSTRATION | PAGE |
|----------------------|------|
| Chassis..... | G2 |
| Circuit Breaker..... | G4 |

CHASSIS



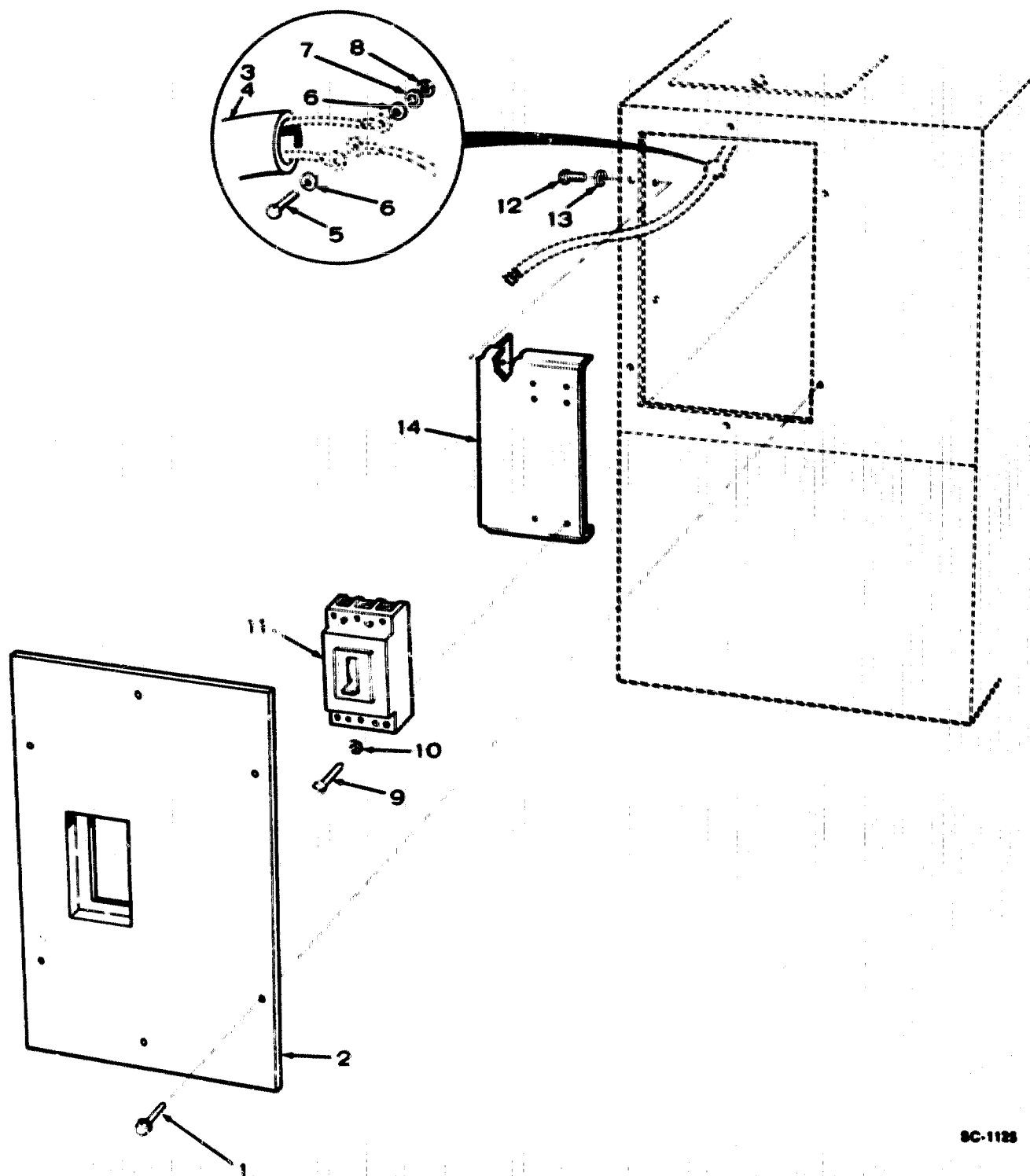
M-1510

CHASSIS

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|-------------|-------------|--------------|---|
| 1 | 800-0520 | 2 | Screw, Cap - Hex Head (3/4-10 x 1") |
| 2 | 800-0050 | 2 | Screw, Cap - Hex Head (3/8-16 x 1") |
| 3 | 850-0050 | 2 | Washer, Lock - Spring (3/8") |
| 4 | 526-0026 | 2 | Washer, Flat |
| 5 | 800-0072 | 1 | Screw, Cap - Hex Head (7/16-14 x 1-1/4") |
| 6 | 856-0012 | 1 | Washer, Lock - External/Internal Tooth (7/16") |
| 7 | 800-0091 | 1 | Screw, Cap - Hex Head (1/2-13 x 1-1/4") |
| 8 | 856-0013 | 1 | Washer, Lock - External/Internal Tooth (1/2") |
| 9 | 850-0060 | 1 | Washer, Lock - Spring (1/2") |
| 10 | 862-0016 | 1 | Nut, Hex (1/2-13) |
| 11 | 337-0090 | 1 | Strap, Electrical |
| 12 | 800-0028 | 1 | Screw, Cap - Hex Head (5/16-18 x 1") |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|-------------|-------------|--------------|---|
| 13 | 856-0008 | 1 | Washer, Lock - External/Internal Tooth (5/16") |
| 14 | 850-0045 | 1 | Washer, Lock - Spring (5/16") |
| 15 | 862-0015 | 1 | Nut, Hex (5/16-18) |
| 16 | 332-1473 | 1 | Terminal, Lug |
| 17 | 800-0090 | 2 | Screw, Cap - Hex Head (1/2-13 x 1") |
| 18 | 850-0060 | 2 | Washer, Lock - Spring (1/2") |
| 19 | 862-0016 | 2 | Nut, Hex (1/2-13) |
| 20 | 800-0520 | 1 | Screw, Cap - Hex Head (3/4-10 x 1") |
| 21 | 402-0030 | 1 | Mount, Vibration - Engine |
| 22 | 403-0910 | 1 | Support, Mounting - Engine |
| 23 | 800-0071 | 4 | Screw, Cap - Hex Head (7/16-14 x 1") |
| 24 | 850-0055 | 4 | Washer, Lock - Spring (7/16") |
| 25 | 862-0004 | 4 | Nut, Hex (7/16-14) |
| 26 | 402-0030 | 2 | Mount, Vibration - Generator |
| 27 | 403-0917 | 1 | Chassis |

CIRCUIT BREAKER



SC-1125

CIRCUIT BREAKER

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--|-----------|--|
| 1 | 815-0350 | 6 | Screw, Tapping - Hex Washer Head (#10-32 x 3/8") |
| 2 | 301-3192 | 1 | Panel, Cover - Circuit Breaker |
| 3 | SLEEVING, INSULATION - SHRINKABLE (Select as Required) | | |
| | 898-0863 | | 3/4" ID |
| | 898-0865 | | 1" ID |
| | 898-0875 | | 1-1/2" ID |
| | 898-0869 | | 2" ID |
| 4 | SLEEVING, INSULATION - FIBERGLASS (Select as Required) | | |
| | 898-0974 | | 3/4" ID |
| | 898-0976 | | 1" ID |
| 5 | 800-0028 | 5 | Screw, Cap - Hex Head (5/16-18 x 1") |
| 6 | 526-0022 | 10 | Washer, Flat (21/64" ID x 9/16" OD x 1/16" Thk) |
| 7 | 850-0045 | 5 | Washer, Lock - Spring (5/16") |
| 8 | 862-0015 | 5 | Nut, Hex (5/16-18) |
| 9 | 812-0094 | 4 | Screw, Machine - Round Head (#8-32 x 3-5 8") |
| 10 | 850-0025 | 4 | Washer, Lock - Spring (#8) |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION |
|----------|--------------------------------------|-----------|--|
| 11 | CIRCUIT BREAKER (Select as Required) | | |
| | | | 40-50-60 AMP |
| | 320-0415 | 1 | 40 AMP, 3 PH, 347/600 VAC |
| | 320-0413 | 1 | 50 AMP, 3 PH, 277/480 VAC |
| | 320-0384 | 1 | 60 AMP, 3 PH, 200/346 - 220/380 VAC |
| | 320-0416 | 1 | 60 AMP, 3 PH, 347/600 VAC |
| | | | 70-90-100 AMP |
| | 320-0414 | 1 | 70 AMP, 3 PH, 277/480 VAC |
| | 320-0417 | 1 | 70 AMP, 3 PH, 347/600 VAC |
| | 320-0411 | 1 | 90 AMP, 3 PH, 120/240 VAC |
| | 320-0379 | 1 | 90 AMP, 3 PH, 200/346 - 220/380 - 277/480 VAC |
| | 320-0418 | 1 | 90 AMP, 3 PH, 347/600 VAC |
| | 320-0412 | 1 | 100 AMP, 3 PH, 120/208 VAC |
| | 320-0380 | 1 | 100 AMP, 3 PH, 200/346 - 220/380 - 277/480 VAC |
| | 320-0771 | 1 | 100 AMP, 3 PH, 127/220 VAC with 24 VDC shunt trip and AUX contacts |
| | | | 125 AMP |
| | 320-0419 | 1 | 125 AMP, 3 PH, 200/346 - 220/380 VAC |
| | | | 150 AMP |
| | 320-0346 | 1 | 150 Amp, 3 PH, 120/208 - 120/240 VAC |
| | 320-0425 | 1 | 150 AMP, 3 PH, 200/346 VAC |
| | 320-0772 | 1 | 150 AMP, 3 PH, 127/220 VAC with 12 VDC shunt trip and AUX contacts |
| | | | 175 AMP |
| | 320-0344 | 1 | 175 AMP, 1 PH, 120/240 VAC |
| | 320-0347 | 1 | 175 AMP, 3 PH, 120/208 - 120/240 VAC |
| | 320-0773 | 1 | 175 AMP, 3 PH, 127/220 VAC with 12 VDC shunt trip and AUX contacts |
| | | | 200 AMP |
| | 320-0348 | 1 | 200 AMP, 3 PH, 120/208 - 120/240 VAC |
| | | | 225 AMP |
| | 320-0359 | 1 | 225 AMP, 1 PH, 120/240 VAC |
| | 320-0349 | 1 | 225 AMP, 3 PH, 120/208 VAC |
| 12 | 800-0003 | 2 | Screw, Cap - Hex Head (1/4-20 x 1/2") |
| 13 | 850-0040 | 2 | Washer, Lock - Spring (1/4") |
| 14 | 301-3197 | 1 | Bracket, Mounting - Circuit Breaker |

NOTE - For Circuit Breakers with special features like Shunt Trip, AUX Contacts etc., not listed above - Contact your nearest Onan Parts Center and provide your Model, Serial and Specification numbers. Also provide any identification numbers or rating from the Circuit Breaker to be replaced.